UNIVERSITY OF CAPE COAST

FINANCIAL DEVELOPMENT, ECONOMIC GROWTH, AND POVERTY REDUCTION: EVIDENCE FROM GHANA

ERIC JUSTICE EDUBOAH

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BY

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Thesis submitted to the Department of Economics of the Faculty of Social Sciences, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy degree in Economics

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:..... Date:11/07/2018

Name: Eric Justice Eduboah

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:..... Date:11/07/2018

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ABSTRACT

The study investigates the relationship between financial development, economic growth, and poverty reduction using quarterly data from 1990:1 to 2015:4 for Ghana, applying Maximum Likelihood Estimation technique and by means of the Autoregressive Distributed Lag (ARDL) approach and the Granger causality test. The study found a unique cointegration relationship between and among the key variables in the models. Further, banking sector, stock market, bond market, government expenditure, gross fixed capital formation, trade openness, and foreign direct investment exerted positive and statistically significant effects on economic growth both in the short-run and the long-run suggesting that these variables positively influence economic growth in Ghana. However, inflation and real interest rate have negative and statistically significant effects on both the financial development and the economic growth. Again, financial development, economic growth, trade openness government expenditure, and gross fixed capital formation exerted negative and statistically significant effects on poverty reduction. This means these variables help in reducing poverty. However, inflation is positive in sign and detrimental to poverty reduction. The Granger causality test results generally revealed unidirectional causality between and among the key variables in the models. It is therefore recommended that Government of Ghana and Central Bank of Ghana need to maintain a continuous effort in developing the financial sector. This will in turn spur economic growth, and hence poverty reduction.

KEYWORDS

Economic growth

Financial development

Financial openness

McKinnon conduit effect

Poverty reduction

Principal component analysis (PCA)

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DEDICATION

To my wife, Helena Awortwe Dadson, and to my children, Lizzy,

Irene, and Papa Jonah Jnr.

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LIST OF ACRONYMS

2SLS	Two Stage Least Squares
3SLS	Three Stage Least Squares
ADB	Agricultural Development Bank
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
BoG	Bank of Ghana
CDH	Consolidated Discount House
CIA	Central Intelligence Agency
CIEA	Composite Index of Economic Activities
CUSUM	Cumulative Sum of Recursive Residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
DMBs	Deposit Money Banks
DW	Durbin Watson
EAP	Economically Active Population
ECM	Error Correction Model
ECT	Error Correction Term
ERP	Economic Recovery Programme
FBs	Forex Bureaus
FINSAP	Financial Sector Adjustment Programme
FINSSP	Financial Sector Strategic Plan
FSAP	Financial Sector Assessment Programme
GCB	Ghana Commercial Bank

GDP	Gross Domestic Product
GMM	Generalized Methods of Moment
GSE	Ghana Stock Exchange
GSS	Ghana Statistical Service
HIPC	Heavily Indebted Poor Country
IAA	Innovative Accounting Approach
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
IT	Information Technology
LDCs	Least Developed Countries
MBG	Merchant Bank Ghana Limited
MCC	Millennium Challenge Corporation
MENA	Middle East and North Africa
MOFA	Ministry of Food and Agriculture
NDC	National Democratic Congress
NFBI	Non-Bank Financial Institution
NIB	National Investment Bank
NPLs	Nonperforming Loans
NS&CB	National Savings and Credit Bank
OFY	Operation Feed Yourself
OFYI	Operation Feed Your Industries
OLS	Ordinary Least Squares
OMO	Open Market Operations
PBT	Profit Before Tax
PCA	Principal Component Analysis

PP	Phillips-Perron
RCBs	Rural and Community Banks
RoSCAs	Rotating Savings and Credit Associations
SACU	Southern African Customs Union
SADC	Southern Africa Development Community
SAP	Structural Adjustment Programme
SBC	Schwarz Bayesian Criterion
SBs	State- Owned Banks
SDC	Security Discount Company
SIC	Schwarz Information Criterion
SMEs	Small-and Medium Enterprises
SOEs	State-Owned Enterprises
SSA	Sub-Saharan Africa
SSNIT	Social Security and National Insurance Trust
TFP	Total Factor Productivity
UK	United Kingdom
UN	United Nations
US	United States
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
WDI	World Development Indicator

CHAPTER ONE

INTRODUCTION

Introduction

This chapter presents the background to the study, problem statement, objectives of the study and the statement of the hypotheses. In addition, the significance of the study, scope, and the organisation of the study are also covered. Financial development is a very broad and complex concept that involves many financial markets and institutions and therefore cannot be measured by single indicator as has been the case in the past. This is because according to Quartey and Prah (2008a), measurement of financial development does not only affect the direction of causality of the variables in the model but also the magnitudes.

Again, there is no doubt that financial development plays a crucial role in the economic growth and development process of a country like Ghana. Theoretical and empirical studies support the positive role of finance in the development process of both advanced and developing economies (Acheampong, 2007; McKinnon & Shaw, 1973). It is therefore imperative to investigate how financial development should be measured as this has implications for policy formulations and prescriptions on the economy. Further, sources of economic growth are a function of many factors including financial development, however, specific market, and institution or both of financial sector that drives growth has not been established in the literature, hence this thesis disaggregates financial development into banking sector, stock market and bond market so as to capture the effect that each has on economic growth and poverty reduction in Ghana.

Background to the Study

Financial development, economic growth, and poverty reduction nexus has been researched and debated extensively by researchers with varying conclusions because of how financial development has been measured and understood. Financial development is defined as a combination of depth (size and liquidity of markets), access (ability of individuals to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues), and the level of activity of capital markets (Sahay, Čihák, N'Diaye, & Barajas, 2015).

Financial development is a process that marks improvement in quantity, quality, and efficiency of financial intermediary services. This process involves the interaction of many activities and institutions and possibly is associated with economic growth. Put differently, the size, structure and efficiency of a financial system determine development. One way that such development has been known to take place is through financial openness (or financial liberalisation), which is a process that gets rid of inefficient financial institutions and creates pressure for the financial infrastructures to be reformed, leading to a more efficient financial system. This increases the accessibility of finance as information asymmetry may be alleviated while adverse selection and moral hazard will be low (Huang, 2006).

The role of any efficient financial system is to channel funds from surplus units to deficit spending units to finance productive firms and investment projects. However, in practice this is not always the case because mostly large firms tend to get funds while small and medium sized enterprises (SMEs) are left to rely on curb market or informal sources of finance.

The predominant view on financial development is that it increases the accessibility to financial instruments and institutions which decreases transaction cost, thereby channeling funds to efficient economic agents who can use it to invest in both human and physical capital thereby stimulating economic growth. Furthermore, it also enables the poor to rely on accumulated savings or to spend on income enhancing assets. Additionally, a bank account gives a sense of security which helps the poor to create a defense against shocks and financial development enhances access to capital for entrepreneurs who help in financing technological development (Seetanah, Ramessur, & Rojid, 2009).

The possible determinants of financial development have ranged from legal systems and institutions (Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997; Beck & Levine, 2008) to financial and trade openness (Chinn & Ito, 2005; Huang & Temple, 2005). Nelson and Phelps (1966) identified factor endowments such as capital-labour ratio, education level as the precursors of financial development. In addition, other determinants of financial development identified are changes in technology. According to Shleifer and Vishny (1993), differences in legal regimes determine investor protection and inevitably investment levels which in turn influences financial development.

Proper policy measures such as financial openness and trade liberalisation have also been officially declared as determinants of financial development. Freeing the financial system from government intervention allows a more efficient allocation of resources by various economic agents while liberalising trade reduces the power of interest groups who capture politicians to shape policies in their favour which impedes financial development As such, the liberalisation process reduces inefficiency, improves

transparency and fosters a competitive environment which is conducive for the economy as a whole (Seetanah et al., 2009).

However, despite the number of possible variables that have been outlined to cause financial development, there is no particular variable that has been found to primarily determine financial development (Benyah, 2010). This means a combination of variables helps determine the financial development of a specific economy.

Developing economies in the last few decades have tended to development strategies that focus more on the modernisation and liberalisation of their financial systems. The countries of sub-Saharan Africa are no exception. The 1980s have seen most of these countries undertake policies aimed at lowering the levels of financial repression by generally reducing the extent of governmental intervention in national financial sectors, via the privatisation of banks. These policies were expected to promote growth through financial development and this was to be realised through a higher mobilisation of savings, a rise in domestic and foreign investments or a general improvement in the efficiency of resource allocation (Cobbina-Asirifi, 1999).

As with most developing countries that have pursued economic and structural reforms, Ghana has undergone a process of financial sector restructuring and transformation as an integral part of a comprehensive macroeconomic adjustment programme. With the support of the International Monetary Fund (IMF) and World Bank, financial market liberalisation in Ghana began in the late 1980s, under the Financial Sector Adjustment Programme (FINSAP), with the restructuring of distressed banks and cleaning up non-performing assets to restore banks to profitability and viability. The programme

set prices right, initiated structural reforms, including fiscal and monetary operations, and privatisations including banks (Bawumia, 2010).

The adoption of the FINSAP was part of a strategy to move the Ghanaian financial sector from an era of financial repression towards one of financial liberalisation. This included the liberalisation of interest rate, abolition of directed credit, restructuring of financially distressed banks, improving the regulatory and supervisory framework, privatisation of state owned banks, promotion of non-bank financial institutions, liberalisation of the foreign exchange markets, establishment of forex bureau, and the beginning of a capital market with the establishment of the Ghana stock exchange in 1990.

Bawumia (2010) explained that by 2001, a number of constraints still remained in the financial sector. These include high nominal interest rate spread, low financial intermediation, crowding out of the private sector in the credit market, cash dominated payment system, large unbanked population, the absence of a credit information system, a complex exchange regime, and the absence of a clear legal framework that addressed the rights and responsibilities of borrowers and lenders. There was also a need to fashion a legislative framework that would allow Ghana to position herself as an international financial center within the sub-region.

Bawumia (2010) further stated that these issues led to the launch of a new wave of home grown reforms, some of which were later placed under the banner of the Financial Sector Strategic Plan (FINSSP) in 2003. The stated objectives of FINSSP were: to make the financial sector the preferred source of finance for domestic companies, promote efficient savings mobilisation, establish Ghana as the financial gateway to the Economic Community of West

African States (ECOWAS) region, enhance the competitiveness of Ghana's financial institutions; ensure a stronger but "user-friendly" regulatory regime, and achieve a diversified domestic financial sector within a competitive environment (Eduboah, 2013).

The Ghanaian financial system has been profoundly transformed since the joint IMF-World Bank Financial Sector Assessment Programme (FSAP) assessment in 2000 (and its update in 2003). The FSAP identified key elements of a medium-term financial-sector strategy reflecting the government's priorities. The success of Ghana's financial sector reforms can be attributed largely to solid "buy-in" from key stakeholders, especially the private sector and coordinated donor assistance. This success is evident in the following respect: First, the financial sector development has had a notable impact on growth, which rose to 6.3 percent in 2007 from 4.5 percent in 2002 prior to the onset of reforms (Bawumia, Owusu-Danso, & McIntyre, 2008).

Also, the ratio of money (M2) to GDP, the traditional measure of financial deepening, doubled after 2004, reaching 43 percent of GDP by the end of 2007. Much of the increase was funded by an increase in demand and savings deposits. Moreover, the banking system has grown rapidly, fueled by fast credit expansion. Banks now account for about 70 percent of the financial sector. Further, financial sector vulnerabilities have been reduced. Improved banking supervision now gives priority to capital adequacy, bank risk management, and more on-site supervision (Bawumia et al, 2008).

Statement of the Problem

Over the past few decades, the role of financial development in economic growth and development process and hence poverty reduction has

attracted significant attention from finance and development experts and has been debated extensively. This debate can be characterised into four main theoretical paradigms or propositions: the supply-leading hypothesis or the Liberal School (McKinnon & Shaw, 1973; Neusser & Kugler, 1998), Conservative School otherwise known as demand-following hypothesis (Robinson, 1952; Patrick, 1966; Ireland, 1994), the Endogenous Growth Theory (Greenwood & Smith, 1997; Blackburn & Hung, 1998) and the Stern-Lucas Proposition (Kuznets, 1955; Meir & Seers, 1984; Lucas, 1988; Stern, 1989). Given these alternative theoretical paradigms, empirical evidence especially time series studies have generally been mixed and inconclusive.

However, specific studies on the finance-growth nexus in sub-Saharan African countries especially Ghana, are very few. Some of these studies have used cross-country regression method. This method is saddled with heterogeneity bias. As such, it fails to address the country-specific effects of financial development on economic growth which may lead to inconsistent and misleading estimates (Caselli, Esquivel, & Lefort, 1996; Ghirmay, 2004; Quah, 1993).

In addition, some other studies using time series employed a bivariate VAR framework (Al-Yousif, 2002; Quartey & Prah, 2008). In Ghana, Quartey and Prah (2008b) found evidence for both the demand-following and independent hypotheses in Ghana when different measures of financial development were used. However, bivariate tests suffer from omitted variables problem and lead to erroneous causal inferences (Loizides & Vamvoukas, 2005).

Adam and Siaw, (2010) using a trivariate VAR found evidence for the bi-directional causality proposition in Ghana. However, it is obvious that an introduction of additional variables in the causality framework may not only alter the direction of causality but also the magnitude of the estimates (Loizides & Vamvoukas, 2005).

Furthermore, Ghana's real GDP growth rate has been declining since 2011 (ISSER 2012, IMF 2014a). The economy's real GDP growth rate of 5.4 percent was short of targeted rate of 8.8 percent in 2013 and this is the largest since 2008. An epitome of this is that, in 2012 the shortfall was 0.6 percent, compared to the 3.4 percent in 2013.The Ghana's growth in 2013 was particularly oil-drifted, with the non-oil GDP growth rate of 3.9 percent, compared with 5.9 percent growth rate for the overall GDP (ISSER, 2013) According to IMF, (2015a), Ghana's GDP continues to decline with 4.0 percent in 2014 and 3.1 percent in 2015 respectively, (GSS, 2016).

In spite of the financial reforms in Ghana since 1988, Ghana's GDP growth rates over the period have not recorded growth rates comparable to the countries of similar economic characteristics, but slightly above the average of 3.4% of the Sub-Saharan African (SSA) (IMF, 2016a). This is evident in high unemployment rates and its associated increasing number of individuals in poverty in Ghana. According to the Ghana Statistical Service (GSS), 6.7 million Ghanaians fall within the UN definition of poverty.

Again, as stated earlier, Abu-Bader & Abu- Qarn,(2008), Quartey and Prah,(2008) believe that there is no single measure of financial development and different measures of financial development do not only affect the direction of causality but also the statistical power of the variables involved in a model

specification and this has resulted in an ineffective policy prescriptions. In the finance-growth literature, there is no consensus on how financial development should be measured; different indicators have been used to measure financial development. For instance, the ratio of broad money or liquid liabilities to GDP (M2/GDP or M3/GDP),credit to private sector as a percentage of GDP (PSC % of GDP),private sector credit as a ratio of total domestic credit(PSC/TDC), stock market capitalisation as a percentage of GDP (SMC % of GDP), just to mention but a few. Obviously, in the face of these different indicators for measuring financial development, results of empirical studies are bound to differ as have been the case in finance-growth literature across countries and Ghana in particular. A solution to having different indicators for measuring financial development is to construct an index using Principal Component Analysis (PCA) for financial development which will encapsulate, if not all the indicators for measuring financial development, a greater percentage of the indicators will be captured in the index and this is more representative than using a single measure for financial sector development.

Furthermore, endogenous growth literature (King & Levine, 1993a) and McKinnon-Shaw thesis (1973) predict a positive relationship between financial development and economic growth (McKinnon Conduit Effect) in the face of other control variables. However, financial sector development comprises many markets and institutions, and the relationships among them; theories and empirical expositions on finance-growth nexus have been silent on which markets and or institutions or sub-sectors of financial sector development that drive economic growth in Ghana and the extent to which growth in the financial sector has impacted poverty reduction.

To this end, financial sector in Ghana can be disaggregated into money market and capital market as well as derivative market. However, since the derivative market is not well developed in Ghana (Bawumia, 2010), the study focused more on money market and capital market .The money market, mainly banking sector is where short term loans are extended to the economic agents whereas the capital market is where long term loans are extended to the economic agents. The capital market can further be disaggregated into stock market and bond market.

The questions that this thesis seeks to answer as far as the effects of financial sector development on economic growth and hence poverty reduction in Ghana are concerned since the financial sector reforms in 1988 as part of the overall Economic Reforms Programme (ERP) are:

1 Does financial openness affect financial development in Ghana?

2 Which market of the financial sector development drive economic growth more in Ghana?

3 Has the financial development in Ghana affected poverty reduction?

Objectives of the Study

The general objective of this thesis is to investigate the effects of financial sector development on economic growth, and whether or not this has resulted in poverty reduction in Ghana, using quarterly time series dataset from 1991:1 to 2015:4.

The specific objectives of the study are to:

1 Investigate the effects of financial openness (financial liberalisation) on financial development, using an index in Ghana.

2 Determine which markets of financial sector development affects economic growth most in Ghana.

3 Examine the effects of financial development on poverty reduction in Ghana.

Hypotheses of the Study

Following the objectives of the study and within the context of financial development and economic growth, as well as poverty reduction nexus, the main hypotheses are as follows:

1 H_O: Financial openness does not affect financial development in Ghana.

H_A: Financial openness does affect financial development in Ghana.

2 H_O: Banking sector development, stock market development, and bond market development do not affect economic growth in Ghana

H_A: Banking sector development, stock market development, and bond market development do affect economic growth in Ghana.

3 H_O: Financial development does not affect poverty reduction in Ghana.

H_A: Financial development does affect poverty reduction in Ghana.

Significance of the Study

Governments all over the world and policy makers acknowledge the importance of the growth of the real sector and its implications for overall economic growth and development which will ultimately trickle down to affect the wellbeing of the citizens, all other things being equal. Therefore there is the need to examine how the growth performance can be optimised. For this to happen, it is imperative to firstly establish which factors promote economic growth in the Ghanaian economy. This will then facilitate the design and

prescription of policies that will enable Ghana to fully utilise these factors properly and receive the maximum benefit she can derive from them.

To this end, the study is therefore meant amongst other things to contribute significantly to literature and methodologically by empirically investigating the role of financial development in Ghana's growth and development process and the causal relationships between them, using ARDL modelling and Granger Causality test. The results from this study will be useful in recommending appropriate policy measures to improve financial sector and thereby stimulating economic growth and hence poverty reduction in Ghana and also extend the frontier of knowledge in empirical research which will also provide basis for further research.

Again, previous studies have used one or two indicators as proxies for financial development which are not representative enough to reflect the financial sector of Ghana. However, since 1970s, most of the empirical literature approximates financial development by the ratio of private credit to GDP, and to a lesser extent, by stock market capiltalisation, also as a ratio to GDP (Sahay, Čihák, N'Diaye, & Barajas, 2015b) .The financial development index developed for the investigation in this thesis encompasses institutions—banking and nonbanking, as well as markets, and across three dimensions: depth, access, and efficiency. According to Sahay, R et al (2015), the diversity of financial systems across countries implies that one needs to look at multiple indicators to measure financial development. Therefore, in this thesis, financial development is better measured than the previous studies and the results are more robust for Ghana. As a contribution, this study also disaggregates financial development into various financial institutions and markets, and this is where

this study departs from other studies,(Acheampong, 2007b; Quartey & Prah, 2005).Financial institutions include banks, insurance companies, mutual funds, pension funds, and other types of nonbank financial institutions. Financial markets, on the hand include money and capital markets. The capital markets can further be disaggregated into stock and bond markets. In this regard, effects of financial development on economic growth can be investigated and assessed under the lens of financial institutions and markets in a single study.

Scope of the Study

This study examines the determinants of economic growth in Ghana using quarterly series data from 1991:1 to 2015:4. The choice of the data coverage is based on the fact that development of Ghana's financial sector started with the financial sector reforms in 1988 (Bawumia, 2010); and Ghana's Stock Exchange was established and began operational in 1990. The study adopts the Autoregressive Distributed Lag (ARDL) econometric methodology for cointegration to obtain both the short-run and long-run parameters of the main variables. This is because of the nature of the study (which is time series analysis) and the objectives set for the study as well as the span of the data. The variables in the study include: real gross domestic product which is used as a proxy for economic growth, financial development, government final consumption expenditure, real interest rate, gross fixed capital formation which is the proxy for capital, inflation, trade openness, financial openness, final consumption expenditure per capita, which is used as a proxy for poverty reduction and finally, foreign direct investment.

Again, financial sector development is disaggregated into banking sector development, stock market development and bond market development and Principal Component Analysis (PCA) is used to construct an index for each subsector of the financial sector.

Organisation of the Study

This study is organised into eight related chapters. Chapter one, which is the introductory chapter, presents the background to the study, problem statement, objectives of the study, hypotheses, significance and scope of the study as well as organisation of the study. Chapter two presents and discusses Ghana's financial sector in the context of the Ghanaian economy as whole, whilst chapter three presents review of related literature, both theoretical and empirical review relevant to the study. Chapter four presents the methodological framework and techniques employed in conducting the study. Specifically, chapter four deals with theoretical and empirical models specifications, definitions and measurements of the variables involved in the study, sources of data, tools for statistical analyses, and finally, Principal Component Analysis (PCA) for the construction of financial sector development index, banking sector development index, stock market development index, and bond market development index are also covered. Chapters five, six, and seven, present, examine, and discuss the empirical results and main findings with reference to the literature and in accordance with the objectives of the study respectively. Chapter eight which is the final chapter presents the summary, conclusions and recommendations of the study. This chapter also covers the policy implications, limitations and directions for further research.

CHAPTER TWO

OVERVIEW OF FINANCIAL SECTOR

Introduction

The chapter presents an overview of the Ghanaian economy with specific focus on the overview of the financial sector and its performance as well as its impact on the financial sector in Ghana. The rationale is to give a fair view and draw attention to the various developments that characterise the economy. Ghana's financial sector has gone through several metamorphoses since the adoption of the Economic Reform Programme (ERP) and Structural Adjustment Programme (SAP) in 1983 which were the collective efforts of International Monetary Fund (IMF) and World Bank to help member states, mostly developing countries including Ghana, whose financial sectors were considered under repressed. The chapter focuses on the review of the overall financial sector of Ghana in general and the performance of the Ghanaian economy as well as the recent Bank of Ghana (BoG) proposed regulatory guidelines for the microfinance sub-sector in Ghana.

Overview of the Ghanaian Economy

Ghana as a developing country is well endowed with natural resources and agriculture accounts for roughly one-third of GDP and employs more than half of the workforce, mainly small landholders. The services sector accounts for 50 percent of GDP. Gold and cocoa production and individual remittances are major sources of foreign exchange. Oil production at Ghana's offshore Jubilee field began in mid-December and is expected to boost economic growth. Ghana signed a Millennium Challenge Corporation (MCC) Compact in 2006, which aims to assist in transforming Ghana's agricultural sector. Ghana opted

for debt relief under the Heavily Indebted Poor Country (HIPC) programmes in 2002, and is also benefiting from the Multilateral Debt Relief Initiative that took effect in 2006. In 2009, Ghana signed a three-year Poverty Reduction and Growth Facility with the IMF to improve macroeconomic stability, private sector competitiveness, human resource development, and good governance and civic responsibility. Sound macroeconomic management along with high prices for gold and cocoa helped sustain GDP growth in 2008-2010. In early 2010, Ghana has targeted recovery from high inflation, and current account and budget deficits as her priorities (CIA, 2011).

The Current State of the Ghanaian Economy

The economy of Ghana experienced a high level of macroeconomic instability in 2008 and in the first half of 2009. By the end of June 2009, inflation rate had reached a peak of 20.74 per cent from 12.81 percent in January 2008, generating annual inflation rate of 19.3 percent in 2009. The cedi also depreciated against the US dollar by 50 per cent from January 2008 to June 2009. This macroeconomic instability was caused by the fiscal slippage of 2008 that resulted in a fiscal deficit of 14.5 percent of the GDP (equivalent to about 9.4 percent of the rebased GDP). Additionally, 2008 saw a huge current account deficit of US$3,532.2 million. As a result, gross international reserves reduced from 3.0 months of imports cover as at the end of 2006 to only 2.1 months of imports cover as at the end of 2008. Because of these negative developments, the NDC Government had to adopt austerity measures to bring understanding into the macroeconomic environment when it took office in January 2009. The real GDP only grew by 4.0 percent in 2009. However, due to the prudent fiscal

and macroeconomic management strategies put in place by Government as part of the Better Ghana Agenda, the economy quickly recovered, and it is currently enjoying a great deal of macroeconomic stability accompanied by accelerated economic growth (Ahmed, 2011).

According to Ahmed (2011), the real GDP growth rate increased from 4.0 percent in 2009 to 7.7 percent in 2010. Quarterly GDP data released by the Ghana Statistical Service (GSS) show that even though relative to the last quarter of 2010, real GDP declined by 5.1 percent in the first quarter of 2011 on the account of weaker performance of the agricultural sector due to the seasonality of the sector's production pattern, on year-on-year basis, the first quarter of 2011 recorded a growth rate of 23.0 percent. This is much better than the year-on-year growth rate of 6.7 percent recorded in the first quarter of 2010. The impressive year-on-year real GDP growth in the first quarter of 2011 was driven by crops (mainly cocoa), mining and quarrying, manufacturing, construction, transport and storage, and business service activities. The Bank of Ghana's Composite Index of Economic Activities (CIEA) also showed a real growth rate of 20.5 percent on year-on-year basis for the first half of 2011.It was further explained that Ghana is well on course to realize the projected real GDP growth rate of 14.1 percent in 2011, putting the economy of Ghana as one of the fastest growing economies in the world in 2011.

Moreover, from June 2009 when inflation reached a peak of 20.74 percent, it fell continuously over an eighteen month period to 8.58 percent in December 2010. Even though inflation rate increased marginally to 9.08 percent and 9.16 percent in January and February 2011 respectively, it began to decline

again starting from March 2011 pushing the inflation rate down to 8.39 percent in July 2011.

Further, after the interbank exchange of the cedi to the US dollar depreciated against the US dollar at the rate of 23.5 percent from January to December 2008 and at the rate of 14.8 percent from January to June 2009, it has largely stabilised. For instance, from January to October 2010, the interbank exchange of the cedi to the US dollar stabilised around 1.43 cedis to 1 US dollar, after the cedi appreciated against the US dollar by 2.7 percent from July to December 2009. Even though starting from November 2010, the cedi began to depreciate against the US dollar, which culminated in a 5 percent depreciation rate in January 2011; the exchange rate of the cedi has stabilized since then.

Also, the external sector of the economy has seen a lot of improvement since 2008. The current account deficit decreased from US$3,532.2 million in 2008 to US$1,598 million and US$2,594 million in 2009 and 2010 respectively. Also, the overall balance of the balance of payment improved from a deficit of US$940.9 million in 2008 to surpluses of US$1,158.9 million and US$1,462.7 million in 2009 and 2010 respectively. The first seven months of 2011 has again seen a good performance of the external sector as merchandise exports grew by 62.3 percent driven by gold, cocoa beans, and crude oil exports. This compares with merchandise imports growth of 45.4 per cent for the same period.

Indeed, the strong macroeconomic performance of the country's economy is largely due to Government's continuous pursuance of prudent macroeconomic management strategies. The expansionary fiscal stance of the previous administration leading to the huge budget and current account deficits was brought to an end in 2009. Government commitment to fiscal consolidation

saw the overall budget deficit brought down to 5.7 percent and 5.9 percent of the GDP (rebased) respectively in 2009 and 2010. In 2011, Government is on track to achieve a deficit of about 5.1 percent of the GDP. The monetary policy has also been carefully tailored to deepen the prevailing macroeconomic stability to enhance economic growth. Growth rate in the broad money supply (M2+), on year-on-year basis, decreased from an average of 37.6 percent in 2008 and 33.6 percent in 2009 to 28.7 percent from January to August 2010. Even though broad money supply shows signs of increasing at higher rates in recent months, this is on the account of increased foreign currency deposits (Ahmed, 2011).

Financial Sector Reforms and Performance in Ghana

Financial reforms in Ghana took the form of liberalising the sector. Financial liberalisation variously entails the elimination of interest rate and credit controls, allowing interest rates to find their market level, the elimination of credit and trade controls, and allowing the exchange rate to find its market level through demand and supply conditions, and privatisation of state-owned banks, with encouragement of entry of foreign banks and the creation of a competitive banking sector in Ghana.

The argument for financial liberalisation rests on the supposed link between financial sector and economic growth and development, and hence poverty reduction. Financial sector liberalisation could take two major forms namely liberalising the domestic financial sector and opening the capital account section of the balance of payment of a country for effective inflow and outflow of capital resources. This section of the thesis focuses on the internal financial sector liberalisation basically the banking and non-banking sector

reforms. As far back as the 1970s, the theory of financial sector liberalisation was pioneered by McKinnon and Shaw (1973). They claim that one of the reasons for the poor growth performance of many developing countries including Ghana had been financial controls and government involvement in the financial sector by way of financial restrictions. The basis is that real negative interest rates discouraged savings and encouraged inefficient use of capital. Thus, financial liberalisation, primarily involving deregulation of interest rates would lead to higher levels of savings. Liberalisation would also channel funds to finance productive entrepreneurs (especially those in the informal sector) for more productive projects. Therefore, an increase in real interest rates following liberalisation is meant to propel the economy to operate at the optimum frontier. Financial sector liberalisation also means that re-thinking poverty reduction should encourage saving and expand the supply of credit available to domestic investors (basically households), thereby enabling the economy to grow more quickly through the removal of all financial bottlenecks.

The pre-reform policies of financial repression and public ownership of banks had important consequences for the banking system. Financial depth collapsed, and with it the ability of the banking system to supply credit, including to the priority sectors which financial policies aimed to support. With the exception of those banks which retained foreign equity participation the banks all became insolvent as a result of bad debts and investments in commercially unsuccessful ventures (Aryeetey & Gockel, 1991).

According to Aryeetey and Gockel (1991) extensive government intervention characterised financial sector policies in the post-independence

period. Public ownership dominated the banking system: all of the banks set up between the early 1950s and the late 1980s were wholly or majority owned by the public sector, while the government also acquired minority shares in the two already established foreign banks in the mid-1970s. They stated that interest rates were administratively controlled by the Bank of Ghana (BOG) and a variety of controls were also imposed on the asset allocations of the banks, such as sectoral credit directives. The motivation for these policies was the belief that, because of market imperfections and the nature of the financial system inherited from the colonial period, the desired pattern of investment could not be supported without extensive government intervention in financial markets. They further explain that policies were motivated by three objectives: to raise the level of investment, to change the sectoral pattern of investment, and to keep interest rates both low and stable. Financial sector policies were characterized by severe financial repression, real interest rates were steeply negative and most of the credit was channelled to the public sector.

The period 1983-1988 was an era of crisis in the financial system in Ghana. High default rates had rendered most bank assets non-performing, the high rates of inflation had wiped out the capital base of most banks, and the weakened confidence in the financial system had adversely affected bank deposits. These affected the ability of the banks to perform their intermediation function properly. This also affected the recovery effort initiated under the Economic Recovery Programme (ERP). Thus, in 1988, a comprehensive Financial Sector Adjustment Programme (FINSAP) was launched. The FINSAP was financed with an adjustment credit from the World Bank, with co-financing from Japan and Switzerland. The Government of Ghana also

contributed by converting its loans to the banks into equity and by paying government guaranteed loans to the state-owned-enterprises (Bawumia, 2010).

The financial reform involve institutional restructuring, enhancement of the legal and regulatory framework for banking operations, and liberalizing interest rates. These were carried out in phases. FINSAP-1 covered the period 1988-1991; FINSAP-2 is from 1992-1995; and FINSAP-3 started in 1995. The major objectives of FINSAP-1 were to review the legal and regulatory environment and amend the existing Banking Acts and Laws; restructuring the banking sector to make the banks viable and efficient; and revitalize the financial sector by creating new institutions. The objective of FINSAP-2 and 3 were to continue with the restructuring of the financial sector.

The Banking Law (PNDCL 225) was revised in 1989. The innovations in the new law included the tightening of risk exposure limits, establishment of tighter capital adequacy ratios, strengthening of accounting standards and making them uniform for all banks, broadening the scope for audits of the banks, imposition of stringent reporting requirements, and improvement of on-site and off-site supervision of banks by the Bank of Ghana. A revised Bank of Ghana Law (PNDCL 291) was also enacted in 1992 to give more supervisory powers to the central bank. These two laws together provide the legal and regulatory framework for the banking business in Ghana (Sowa, 2003).

In order to bring more financial institutions under the purview of the Bank of Ghana, Financial Institutions (Non-Banking) Law (PNDCL 328) was also enacted in 1993. This law covered the activities of discount houses, finance houses, acceptance houses, building societies, leasing and hire-purchase

companies, venture capital funding companies, mortgage financing companies, savings and loans companies, and credit unions.

The reforms also involved management and financial restructuring of the banks. New boards were created for most of the banks and there were shake-ups in the top management positions as well. Financial restructuring involved in the main recapiltalisation of the banks with equity injection where liquidity was low, and the cleaning up of their balance sheet of non-performing assets.

Sowa (2003) stated that there was also institutional restructuring of the financial system involving the establishment of new institutions, mergers and liquidation of banks and divestiture of public sector shareholding in some of the banks. Under the FINSAP, five new banks and twenty non-bank institutions were established. This was to encourage competition in the financial sector. In 1995, the Social Security Bank merged with the National Savings and Credit Bank. Under the institutional restructuring, the money market was formalized in the creation in 1991 of a second discount house, the Security Discount Company (SDC) to compete with the Consolidated Discount House (CDH), which was created in 1987. Both were wholly owned by the banks in Ghana and charged with carrying out interbank operations. These institutions help optimize the allocation of resources within the banking sector and facilitate proper mobilisation of resources to the needy sector; thus, reducing structural imbalances in the system.

He further explained that although the first rural bank in Ghana was established in 1976, the period of the financial sector reform saw a lot more of them coming up. This was to make up for the inability of the commercial banks to reach the rural areas and also to support agriculture. The rural banks were

established as small unit-banking operations, which are owned and managed by the rural communities. The central bank also owns shares in the rural banks and also acts as their supervisor. The prime aim was to mobilize savings from the rural folk and also to help cottage industries.

Also, under the FINSAP, Ghana's capital market was established in 1989. The Ghana Stock Exchange (GSE) began full operations in November 1990 with 12 listed companies and 1 Government bond. Market capiltalisation within the first two years of operation increased from 30 billion cedis in 1991 to 43 billion cedis in 1992 while the listed companies increased to 15. In 1993, the total market capiltalisation went up by about 120 percent to 95 billion cedis. Thus, the GSE established itself as a profitable investment venture for the Ghanaian economy with total capital gains amounting to 123 percent at the end of 1993. There is no doubt that the Ghana Stock Exchange has the potential to attract long- term financing of investment in Ghana. During the first seven years of its existence, the market raised about 140 billion cedis and US$ 4.8 million through equities and bonds and the number of listed companies rose to 21 (Sowa, 2003).

Under the financial reform, interest rates have been deregulated. This move was in part to encourage competition among the banks. But, the deregulation of the interest rates was also to conform to the new form of financial programming that Ghana was following under the Structural Adjustment Programme (SAP). Under the SAP, Ghana was using the money supply as the nominal anchor. This implied that the price of money (the rate of interest) should be determined by market forces.

(vi) Improvement of on-site and off-site supervision of banks by the Bank of Ghana.

Subsequently, a revised Bank of Ghana Law (PNDCL 291) was also enacted in 1992 to give more supervisory powers to the Central Bank. These two laws together provide the legal and regulatory framework for the banking sector in Ghana. In order to bring more financial institutions under the purview of the Central Bank of Ghana, a Financial Institutions (Non-Banking) Law (PNDCL 328) was also enacted in 1993. This law covered the activities of discount houses, finance houses, acceptance houses, building societies, leasing and hire-purchase companies, venture capital funding companies, mortgage financing companies, savings and loans companies, and credit unions. The law clearly distinguished the activities of pure banking institutions from those of non-banking institutions which hitherto was not so. These laws brought a lot of financial restructuring into the Ghanaian banking industry. These reforms among others were to promote sound banking practices and also ensure that more Ghanaians were bankable because of the shallow financial depth at that time.

Financial and Institutional Restructuring

Financial restructuring involves any substantial change in a country's financial system, ownership or control, business portfolio, designed to increase the value of the financial institutions. As part of the restructuring, the reforms also involved management and financial restructuring of the commercial banks.

New boards were created for most of the commercial banks and there were shake-ups in the top management positions as well especially in the government owned banks. Financial restructuring involved in the

recapiltalisation of the banks with equity injection where liquidity was low, and the cleaning up of their balance sheet of non-performing assets (NPLs). NPLs were repackaged and sold to individuals as equity shares. For examples government sold significant percentage of her interest in Agricultural Development Bank (ADB), National Investment Bank (NIB) and Ghana Commercial Bank (GCB).

The financial sector liberalisation brought about institutional restructuring of the financial system involving the establishment of new institutions, mergers and liquidation of banks and divestiture of public sector shareholding in some of the banks. Under the FINSAP, five new banks and twenty non-bank institutions were established. This was to encourage competition in the financial sector. In 1995, the Social Security Bank now SG-SSB merged with the National Savings and Credit Bank (NS&CB). Under the institutional restructuring, the money market was formalised and the creation of a second discount house in 1991, the Security Discount Company (SDC) to compete with the Consolidated Discount House (CDH), which was created in 1987. Both were wholly owned by some commercial banks in Ghana and charged with carrying out interbank operations. These institutions helped to optimise the allocation of resources within the banking sector and facilitate proper mobilisation of resources to the needy sector; thus, reducing structural imbalances in the system. Although the first rural bank in Ghana was established in 1976, the period of the financial sector reform saw a lot more of them coming up. This was to make up for the inability of the commercial banks to reach the rural areas and also to support agriculture. The rural banks were established as small unit-banking operations, which are owned and managed by the rural

communities. The central bank also owns shares in the rural banks and also acts as their supervisor. The prime aim was to mobilize savings from the rural folk and also to help cottage industries.

Interest Rate Liberalisation

The financial sector reforms liberalised interest rates to encourage competition among the banks. But, the deregulation of the interest rate was also to conform to the new form of financial programming Ghana was following under the Structural Adjustment Programme (SAP). Under the SAP, Ghana was using the money supply as the nominal anchor. This implied that the price interest rates should be determined by market forces. The move towards interest rate liberalisation was a gradual process. The first distinctive move was the abolition, in September 1987, of the maximum and minimum deposits, except the minimum saving deposit rate, which was temporarily maintained at 12%. In February, 1988 minimum lending rates for commercial banks were also abolished and by March 1989 commercial banks were given the right to determine their own rates and display them in their banking halls. In November 1990, there was further liberalisation of the financial sector by the abolition of 20% mandatory lending to agriculture.

Thus, by the beginning of 1991 the financial sector was almost liberalised. Since the liberalisation, both real lending and real Treasury bill rates have been positive. Saving rates have been struggling to stay positive.

This is reflective of the weak mobilisation efforts by the banks since most savers would rather hold their idle balances in the form of the relatively risk-free but high yielding government bills. In spite of the financial sector reforms embarked

upon there seem to be a large gap between rural and urban access to finance in Ghana. The picture one can see is that the financial sector reform gave little attention to rural financing in Ghana even though majority of Ghanaians live in the rural areas. Again, the financial sector liberalisation did improve access to borrowing by small scale businesses and the poor (Nissanke & Aryeetey, 1995). They attributed this to tightening of monetary controls, introduction of high-yielding securities to mop up liquidity, and efforts to raise the performance of loan portfolio.

Financial System Structure in Ghana

Ghana's financial system is dominated by foreign-owned banks. Commercial banks account for 75 percent of the total assets of the financial system, pension funds follow distantly with a 12 percent share, and the insurance sector is small with 4 percent. Of the 26 commercial banks operating in Ghana, 13 are subsidiaries of foreign banks and their market share is estimated at 51 percent of bank assets. The domestic component of the banking system is dominated by State-Owned Banks (SBs). The state has a controlling interest in five commercial banks, through direct and indirect shareholding by the government, the BOG, and the state-controlled pension fund—the SSNIT. The SBs account for 29 percent of banking system assets. Therefore, the interaction between sovereign and banking risks is high. In particular, the government has tended to use SBs to finance extra budgetary expenditures and the poor performance of SBs has created contingent liabilities for the government. High fiscal deficits have led to arrears that contributed to Nonperforming loans (NPLs) in banks. In addition, the conflict of interest

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created by the BOG's role as a shareholder and as a regulator has undermined supervision (IMF, 2011).

Domestic financial conglomerates are increasing in importance even though they do not yet have a dominant presence. The exact scope of conglomeration in Ghana's financial sector is not fully known. However, at least nine banks, which account for 53 percent of the banking system assets, have subsidiary securities firms and, in selected cases, industrial and insurance companies. Since the banks are not yet supervised on a consolidated basis, and there is no mapping of shareholders and common directors, it is possible that affiliate companies exist, thus, allowing related party lending to occur unnoticed. These growing inter-linkages increase the potential for risks to have a system-wide impact.

The financial sector has grown rapidly, although the growth has not had the intended effect of reducing intermediation costs. There has been a tremendous growth in the total financial system assets increased over the last ten years. The growth has been underpinned by an increase in the number of players in the banking, insurance, capital markets, and microfinance sectors. However, while private sector credit increased, a significant segment of the economy continues to have limited access to finance. The competition also exerted more pressure on staff and funding costs while lending rates have remained high.

Concentration has declined in the banking sector but it remains very high in the rest of the financial industry. The market share of the five largest banks declined from 61 percent at end of 2005 to 46 percent at end of 2010, in part reflecting the licensing of several banks. In the insurance sector, the number of

companies operating almost doubled. However, 5 out of 23 non-life insurance companies continue to write about 78 percent of the premiums and 5 out of 19 life insurance companies write 68 percent of the total life premiums. Similarly, in the capital markets, one company (AngloGold Ashanti) accounts for 67 percent of the stock market capiltalisation. The SSNIT, the main provider of pensions, accounts for over 80 percent of assets under management. Given the high degree of concentration, the stability of the industry could be impacted by developments in a small number of companies (IMF, 2011).

There are also important risks inherent in the operations of banks and in the structure of their balance sheet and the profit and loss accounts. Commercial banks are highly exposed to credit risk, since lending accounts for the bulk of assets and it has grown in an environment of weak credit risk management and enforcement of creditor rights. In addition, banks are increasingly lending to vertically integrated firms and to their employees. The cost structure of banks also exhibits rigidities that reduce banks' flexibility to respond to macroeconomic changes, resulting in high lending rates that respond slowly to changes in the policy rate. The increased reliance on information technology (IT) for service delivery has increased exposure to operational risk.

The government's dominance in economic activity, against the backdrop of weaknesses in fiscal management, further increases vulnerabilities in the banking sector. State-owned enterprises (SOEs) and many Small-and Medium Enterprises (SMEs) rely heavily on business from the government. Consequently, the government's accumulation of payment arrears to contractors and other service providers has undermined their capacity to service their bank loans and created NPLs across the industry. The team had estimated that 46

percent of the NPLs, reported at end-March 2010, were directly or indirectly linked to government arrears. The government subsequently paid off the bulk of the arrears identified at the time of the FSAP, but new arrears have since emerged, but their implications for NPLs in the banking sector is yet to be ascertained (IMF, 2011).

Overview of Banking Industry in Ghana

According to Ameyaw and Krakah, (2010) the banking sector of Ghana in the past could be divided into two groups- the elite foreign banks which concentrated on the rich of the society and the local banks mainly owned by the state. The latter served the interest of most working class people. The elite banks were Barclays Bank (formerly called the Colonial Bank) and Standard Chartered Bank (formerly, Bank of British West Africa). They further stated that second group of banks with state ownership include: Ghana Commercial bank (GCB), Social Security Bank (now SG-SSB), Agricultural Development Bank (ADB), and the National Investment Bank (NIB). Historically, the primary purpose of a bank was to provide loans to trading companies. Banks provided funds to allow businesses to purchase inventory, and collected those funds back with interest when the goods were sold. For centuries, the banking industry only dealt with businesses, not consumers. Banking services have expanded to include services directed at individuals and risks, in these much smaller transactions are pooled.

In the early 1990s, the banking system included the central bank (the Bank of Ghana), three large commercial banks (Ghana Commercial Bank, Barclays Bank of Ghana, and Standard Chartered Bank of Ghana), and seven

secondary banks. Three merchant banks specialized in corporate finance, advisory services, and money and capital market activities: Merchant Bank, Ecobank Ghana, and Continental Acceptances; the latter two were both established in 1990. These and the commercial banks placed short-term deposits with two discount houses set up to enhance the development of Ghana's domestic money market: Consolidated Discount House and Securities Discount House, established in November 1987 and June 1991, respectively. At the bottom of the tier were 100 rural banks, which accounted for only 5 percent of the banking system's total assets (Krakah & Ameyaw, 2010).

There has been large development in the Ghanaian Banking sector, one of which is the expansion in branch network of most of the banks. Bank branches in Ghana increased by 11.3 percent from 309 to 344 from 2002 to 2004 and 81 new branches sprang up between 2004 and 2006. One interesting development in the sector is that there are no more elite banks in operation as the banks that formerly had this status are also chasing the average Ghanaian income earner for his or her business together with the other banks (Shah, Mohsin, Mohmood, & Aziz, 2009).

The banking sector in Ghana currently comprises twenty six (26) deposit money banks (DMBs) and 129 rural banks. Currently all banks in Ghana are operating as Universal Banks which opens endless opportunities to the product range that they may offer. The banking sector has seen the arrival of many banks from the sub-region as it is the policy of the Central Bank to issue licenses to international banks with repute. The policy is geared toward supporting the development of a well-capitalized and robust financial system (Price Waterhouse Coopers (as cited in Shah et al., 2009)).

The banking industry in Ghana has also undergone rapid changes driven partly by technological change and the rapid growth of competing non-bank financial institutions, as well as liberalisation of the financial sector. Competition in the industry has been keen over the past few years. The distinction between merchant, commercial and development banking has become blurred as a result of the introduction of the Universal Banking Concept. Banks are now allowed to undertake a wide range of financial services without restriction. Banks in the country are now offering retail, corporate and investment banking services. There is a strong indication that demand capacities still exist in the growing banking industry (Acquah, 2006).

Moreover, there has been increasing competition in the banking industry over the years. In response to the competitive pressure in the banking industry, banks continued to make significant investments in upgrading information technology platforms by automating and centralizing various back office activities to enhance the quality of service delivery to their customers. In 2008, Standard Chartered Bank, Ecobank Ghana Ltd and Ghana Commercial Bank upgraded their banking application software. In response to the increasing role of IT in banks' service delivery, BOG published guidelines on branchless banking in August 2008 to allow collaboration between banks, telecommunication companies and merchants to provide greater access to banking and financial services to the wider public. Also in 2008, a common electronic platform (e-zwich) was established to further develop the payment and settlement system by making it possible to link all banking institutions with a biometric smartcard as a vehicle for inclusion of all segments of the population (Acquah, 2006).

Developments in the banking system as of January 2008 show a continuous surge in asset growth resulting mainly from credit expansion. Banks' deposits and borrowings were used to fund the growth in assets. Total assets of the banking industry grew on an annual basis by 46.2 percent to GH¢7,807.0 million as of January 2008, compared with 38.1 percent growth for same period in 2007. As of January 2008, net loans and advances had reached GH¢3,868.7 million, recording an annual growth of 59.2 percent compared with growth of 37.6 percent a year earlier. Banks' investments reached GH¢1,363.1 million in January 2008 recording a year-on-year deceleration of 0.4 percent compared with 37.5 percent in the 12-month period to January 2007. The growth in banks' foreign assets picked up in January 2008 reaching 54.7 percent compared with the 20.7 percent recorded during the same period in 2007. Credit-deposit ratio increased to 81.5 percent as of January 2008 from 73.4 per cent in the same period in 2007 (Wandaogou & Jalulah, 2011).

In terms of market share, the industry's total assets grew by 40% between 2007 and 2008. Ghana Commercial Bank (GCB) and Barclays Bank of Ghana Limited collectively hold 29.4% of the industry's assets, while Merchant Bank Ghana Limited (MBG) dropped its share from 7.6 in 2007 to 5.7% in 2008. GCB's total deposits grew by 25% but the bank lost some of its market share despite maintaining the second position. In 2008, GCB's savings account had the fastest growth of 73%; current account grew by 28%, time & fixed deposits fell by 21%. MBG's financial deposit dropped from 5.7% in 2007 to 4.2% in 2008 (Wandaogou & Jalulah, 2011).

Also, in terms of profit margins, the industry's Profit Before Tax (PBT) dropped from 30% in 2007 to 26% in 2008 - a significant rise in impairment

charges and rising staff costs account for the decline. Impairment charge for the year more than doubled whiles staff cost increased by 40%. The high inflation rates coupled with the weakening cedi might account for the worsening loan default rate. However, the industry's net profit after tax grew by 32%. Ecobank Ghana LTD topped PBT in the industry, which resulted mainly from significant transaction gains from foreign currency trading, which doubled over the year. The bank was also successful in controlling cost as it grew its business. Its cost to income ratio averaged 52% below the industry's average of 63% for 2007 and 2008. MBG ranked fifth with an increase in PBT from 17 30.4% in 2007 to 37.6% in 2008, while GCB ranked 13th with a GCB with a relatively small increase in PBT of 30.1% in 2007 to 31.4% in 2008 (Wandaogou & Jalulah, 2011).

Financial Sector Reform and Banking System Performance

The financial sector in Ghana has seen an outstanding gyrate from the pre-1988 reform period. Two major financial sector programmes have implemented which include: The Financial Sector Adjustment Programme (FINSAP) between 1988 and 2000, and the Financial Strategic Plan (FINNSIP) which was largely home grown and with significant input from stakeholders (between 2000 and 2008). Both sets of reform impacted positively on banking and financial system in many areas (Bawumia, 2010).

In the first place, the liberalisation of the financial sector under FINSAP has resulted in an increase in the number of banks and non-banks in the financial sector with increased private sector participation. In 1988 there was seventeen Banks in existence made up of nine commercial banks, five merchant banks and three development banks. Nine new banks were licensed since 1990 and two

banks were liquidated in 1993. Of these seventeen banking institution in existence at the end of 2001, foreign investors held majority of the shares in eight commercial banks, and three banks were state-owned; there are nine purely commercial banks, five merchant banks, and three development banks. By 2009, there were twenty seven banks with foreign investors holding the majority of shares.

Further, it can be observed that there was an increase in the total assets of the banking system from 0.31 percent of GDP in 1993 to 0.44 percent of GDP by 2000 which represent a 42.0 percent increase before declining to 0.38 percent of GDP in 2001. This was partly due to the economic crisis of 2000 which adversely impacted the ability of many bank customers to service their loans (Bawumia, 2010). Since 2001, total assets of the system steadily rose to 0.66 percent of GDP which represent a 73.0 percent increase by 2008. Between the period 1993 and 2000, there was also a shift in the composition of banks assets as lending to the private sector increased at the expense of lending to government. The loan/asset ratio increased from 0.16 in 1993 to 0.40 by 2000 while at the same time the ratio of holdings of treasury and Bank of Ghana bill/total asset declined from 0.40 in 1995 to 0.24 in 2000 before increasing to 0.28 in 2001. This trend was reinforced after 2001 with loans/asset ratio increasing from 0.38 in 2008 while bill/total asset ratio declined significantly from 0.32 in 2002 to 0.14 by 2008.

Also, demand deposit as a proportion of total deposit increased from 48.0 percent in 1993 to 66 percent by 2000, before falling to 61.0 percent in 2001. By 2008 however, there was a trivial decline to 58.0 percent. Over the same period, savings deposit declined from 40.0 percent of total deposits in

1993 to 21.0 percent by 2001 and further declined to 15.0 percent by 2008. Time deposits however increased over the reform periods from 12.0 percent of total deposits in 1993 to 16.0 percent of total deposit by 2000 and further increased to 26.0 percent of total deposits by 2008.

Financial Sector Reforms and Macroeconomic Performance

The benefits of the reform are widely shown in the increased macroeconomic stability as reflected in the macroeconomic variables during the period. Table 1 displays the performance of selected macroeconomic variables. It shows that there was a fall in the rate of inflation in some few years into the reform from 122.87 percent in 1983 to 25.22 percent in 1989 on the average representing a decline of 79.43 percent points. Whereas the highest rate of inflation in the pre-reform period was 122.87 percent, it has been 59.46 percent in 1995 since the full implementation of the reform. Growth rate of GDP experienced a sharp positive increase before the reform from -6.92 percent and -4.56 percent in 1982 and 1983 respectively to 5.63 percent and 5.09 percent in 1988 and 1989 respectively.

Table 1: Performance of Selected Macroeconomic Variables (1970-2010)

Year	M2/GDP %	PRIVY/GDP %	GDP growth %	Prime Rate %	Inflation %
1970	19	8.2	9.72	5.5	3.03
1971	19	12.6	5.21	8.0	9.56
1972	23.7	10.1	-2.48	8.0	10.07
1973	22.6	5.3	2.88	6.0	17.68
1974	21.6	5.7	6.85	6.0	18.13
1975	26.5	5.8	-12.43	8.0	29.82
1976	29.1	5.9	-3.53	8.0	56.08
1977	29.7	5.0	2.27	8.0	116.45
1978	36.6	3.5	8.48	13.5	73.09
1979	22.8	2.8	-2.51	13.5	54.44
1980	20.4	4.1	0.47	13.5	50.20
1981	22.9	3.1	-3.50	19.5	116.40
1982	19.8	3.7	-6.92	10.5	39.80
1983	13.2	2.7	-4.56	14.5	122.87
1984	12.5	3.0	8.65	18.0	39.67
1985	16	4.5	5.09	18.5	10.31
1986	16.6	5.2	5.20	18.5	24.57
1987	17.1	4.3	4.79	20.5	39.82
1988	17.3	3.6	5.63	23.5	31.36
1989	16.9	5.6	5.09	26.0	25.22
1990	13.6	3.9	3.33	26.0	37.26
1991	134	3.2	5.28	33.0	18.03

Table 1 cont'd

1992	17.5	4.6	3.88	20.0	10.06
1993	16	4.6	4.85	30.0	24.96
1994	18.7	5.3	3.3	35.0	24.87
1995	17.5	6.5	4.11	45.0	59.46
1996	19.4	8.3	4.60	45.0	46.56
1997	18	7.3	4.20	45.0	27.89
1998	22.7	10.6	4.70	37.0	14.62
1999	23.7	14.3	4.40	27.0	12.41
2000	26.7	14.2	3.70	27.0	25.19
2001	26.9	11.8	4.00	27.0	32.91
2002	31.5	12.3	4.50	24.5	14.82
2003	32	12.6	5.20	21.5	26.67
2004	33.4	13.1	5.60	18.5	12.62
2005	31.4	14.9	5.90	15.5	15.12
2006	36.2	17.7	6.40	12.5	10.92
2007	40.9	23.5	6.46	13.5	10.73
2008	45.8	27.7	8.43	17.0	16.52
2009	47.0	26	4.32	18.0	19.25
2010	53.0	26	6.62	13.5	10.71

Source: Bank of Ghana (as cited in Bawumia, 2010 pp. 217), and World Development Indicators, 2015.

It is again evident from Table 1 that from 1989 up to 2010, the growth rate of GDP averaged about 5 percent which shows that the reform has had a positive effect on the GDP growth. The reform period also witnessed improvement in the financial development variables. Credit to private sector as a percentage of GDP picked up marginally from 3.0 percent in 1984 to 5.6

percent in 1989 and continued increasing thereafter amid fluctuations to as high as 27.7 percent and 26.0 in 2008 and 2010 respectively. The percentage of money supply to GDP (M2/GDP) declined continuously from 36.6 percent in 1978 to as low as 13.4 percent in 1991 but picked up marginally from 1991 and reached a height of approximately 53.0 percent in 2010 in the reform period. Essentially, both measures of financial development were improved.

Figure 1 depicts some selected measures of financial development. It can be observed that broad money supply as a percentage of GDP (M2/GDP) seems to be mocking credit to the private sector as a percentage of GDP (PRIVY/GDP). It clearly shows that credit to private sector as a percentage of GDP (PRIVY/GDP) and broad money supply as a percentage of GDP (M2/GDP) exhibit a period of decline into the 1980s and thereafter increased steadily during the period of the reforms.

Further, Figures 2 up to 11 indicate trends in some of the key variables in the study. It can be seen that all the variables have positive values with the exception of financial openness which has negative values.

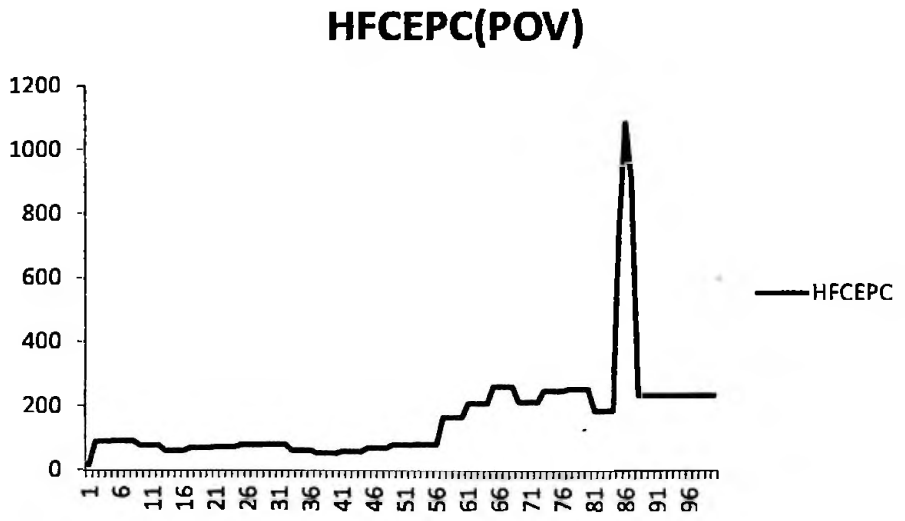

Figure 3: Trend in household final consumption expenditure per capital (1990 -2015)

Source: Designed by the author using data from WDI, 2015.

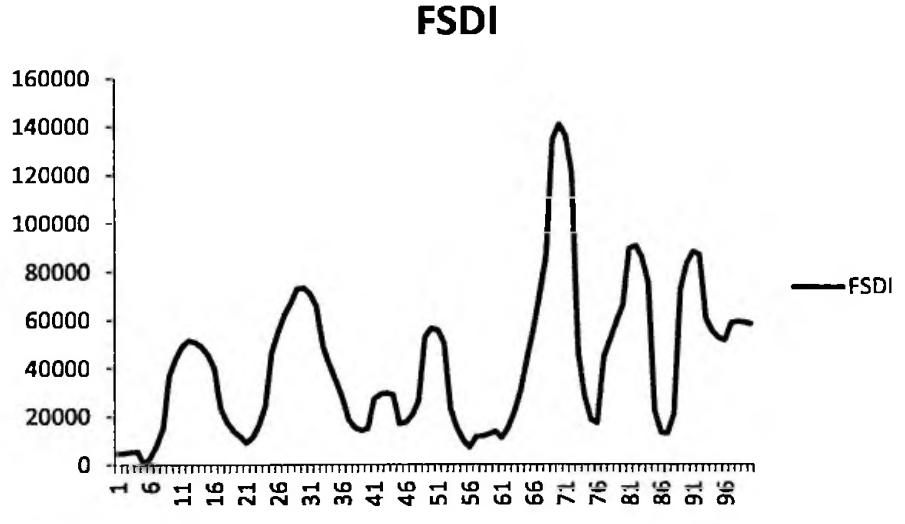

Figure 4: Trend in financial sector development index (1990 -2015)

Source: Designed by the author using data from GSE, 2013 and BoG, 2015

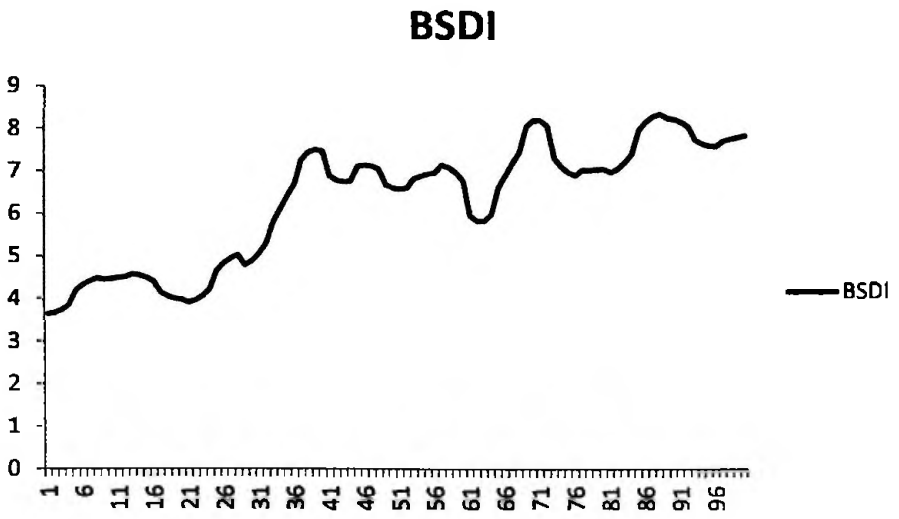

Figure 5: Trend in banking sector development index (1990 -2015)

Source: Designed by the author using data from BoG, 2015.

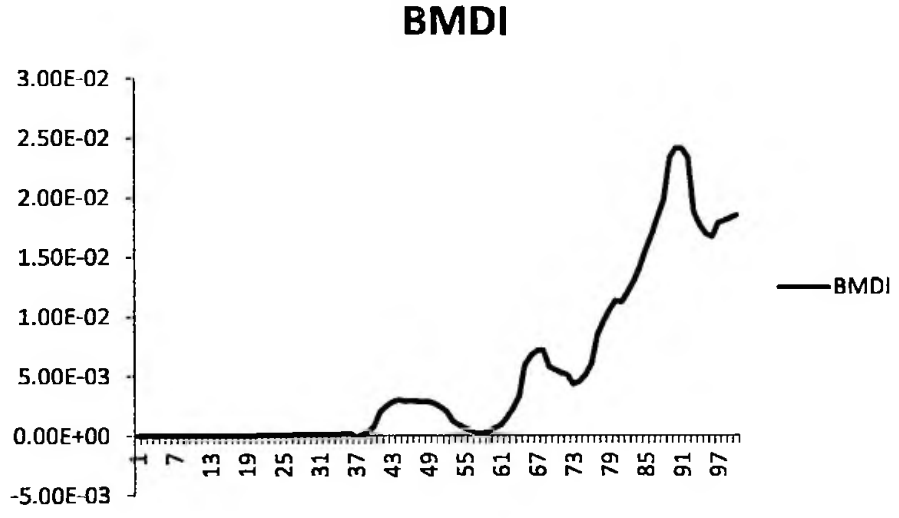

Figure 6: Trend in bond market development index (1990 -2015)

Source: Designed by the author using data from GSE, 2015.

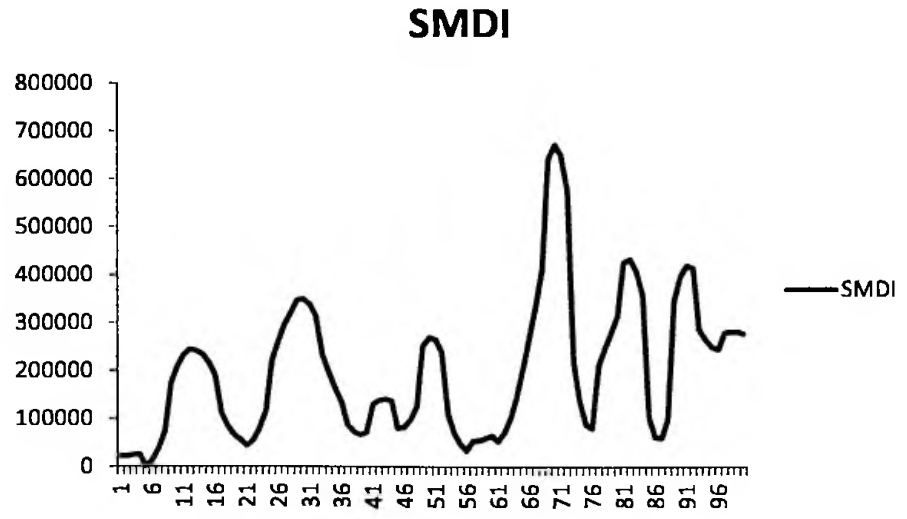

Figure 7: Trend in stock market development index (1990 -2015)

Source: Designed by the author using data from GSE, 2015.

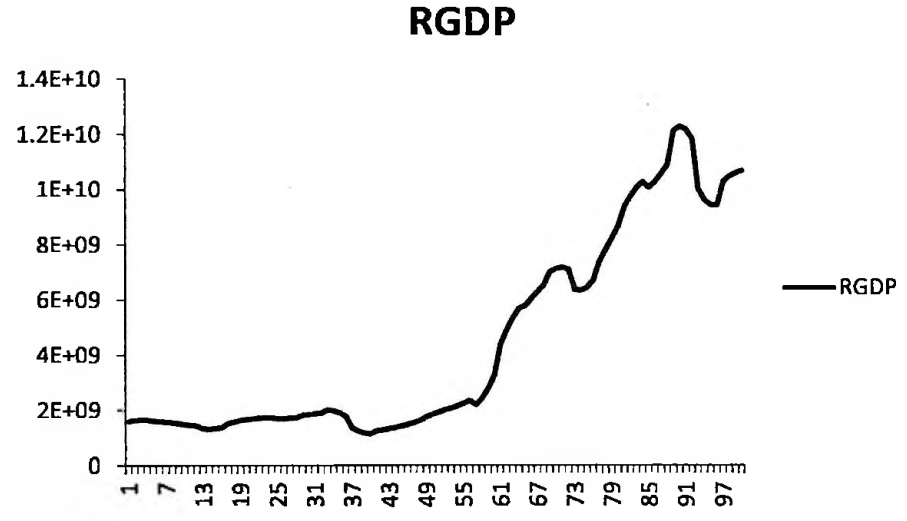

Figure 8: Trend in real gross domestic product (1990 -2015)

Source: Designed by the author using data from WDI, 2015.

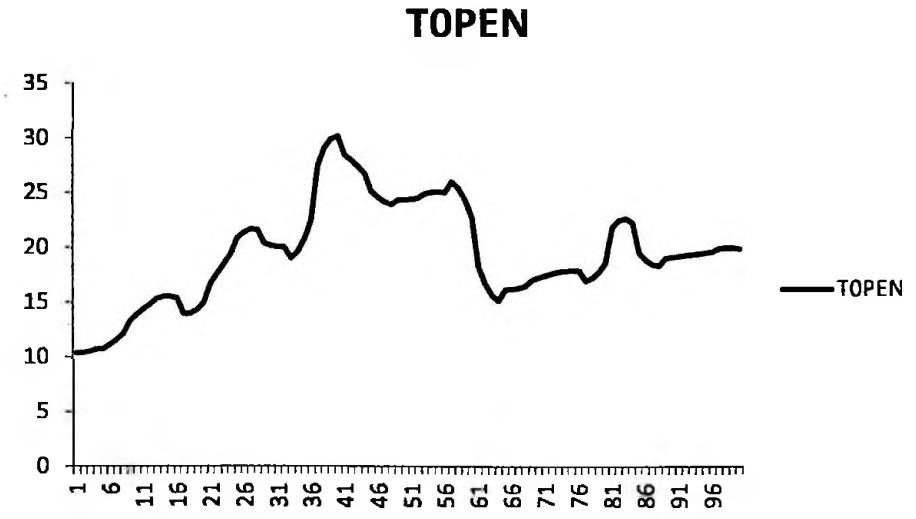

Figure 9: Trend in trade openness (1990 -2015)

Source: Designed by the author using data from WDI, 2015.

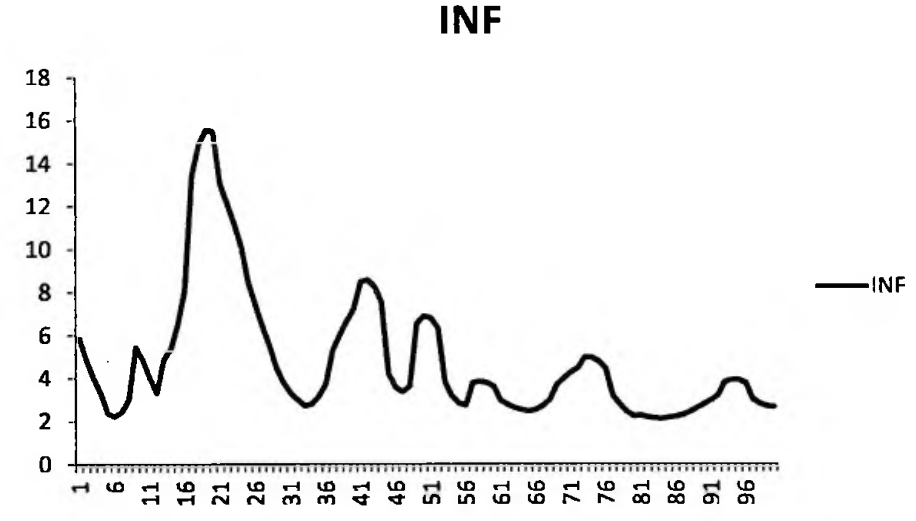

Figure 10: Trend in inflation (1990 -2015)

Source: Designed by the author using data from WDI, 2015.

the three northern regions where the picture may be somewhat different. There is every indication that the formal financial sector has grown in size.

More Rural and Community Banks (RCBs) continue to mushroom in the urban and rural areas of the country. As of 2004 there were about 128 RCBs and by 2010 the number has increased to 133 throughout Ghana. The reform also saw the spread of discount houses listed on the Ghana Stock Exchange, over 10 insurance companies (public and private), and building societies.

By 2001 Ghana's formal financial sector has developed with an increasing number of banking and non-banking financial institutions. As at 2001 total deposits have increased from GH¢ 23.5 million to GH¢ 37.3 million. Out of this deposit, savings alone was 58 percent (Institute for Social, Statistical and Economic Research, 2001) showing a significant increase in savings and time deposits relative to demand deposits as a result of general decline in inflationary expectations in the economy. One major characteristic of Ghana's financial sector is its liberated form. This move was made in September 1987 when a liberalised system to determine borrowing and lending rates was instituted by the Central Bank for all Commercial Banks. This has replaced the previous administrative fixing of rate by the Bank of Ghana. Today, Ghana's financial system is operating the free exchange rate regime. The interest rate as part of the liberalisation policy has also been liberalised, thus no caps are set for lending and borrowing rates in the Ghanaian financial system. The policy is that BoG sets the prime rate and allows banks to set their base rates and lending rates to determine their margins.

Informal finance embraces all transactions that take place beyond the functional scope of various countries' banking and other financial sector

regulations. The informal financial sector is of three types namely savings mobilisation units (including Susu operators) that do little or no lending, lending units that seldom engage in saving mobilisation and units that combine savings mobilisation with lending. The money lenders are generally rich individuals who advance credit at rates well above commercial bank rates, primarily in rural areas. The informal entrepreneurs without access to bank credit approach the money lenders for loans. A hybrid of the savings mobilisers is Susu operators. The Susu is a rotational savings system operated by small-scale operators and low income earners and sometimes in a form of co-operatives. It involves small sums of monies collected on daily basis and the lump sum paid to the client at the end of an agreed period. Usually, the first contribution goes to the operator as his or her income.

In the Ghanaian context, Susu business is usually operated by men. The Susu business can take several forms. The commonest one found in Ghana is the individual Susu where each client contributes to his or her own pool and takes the lump sum at the end of an agreed period usually one month. Another form is the typical Susu club which consists of members who agree to make regular contributions into a common bucket, which is given, in whole or in part, to each contributor in rotational basis. This form of *Susu* savings is described as Rotating Savings and Credit Associations (RoSCAs). The Susu system operates where the individual Susu collector sometimes described as mobile banker, visits savers' shops, work places, market stalls, and homes at agreed times each day and collects a specific amount determined by the saver in consultation with the collector. Many market women, farmers and traders find this form of saving more convenient in achieving their limited saving targets of obtaining a lump

sum at regular intervals to meet working capital and other financial needs. Most rural banks in Ghana today mobilize savings like Susu collectors (Institute for Social, Statistical and Economic Research, 2002) by moving from door to door. They have been helping to cultivate regular savings habits in small-scale business owners and provide easy access to credit for their clients, who are bothered with bureaucratic procedures and the collateral requirements in the formal financial sector. In fact, these informal financial groups fill an important gap left by the formal financial intermediaries. They intermediate between groups of small savers and rather larger individual borrowers (Aryeetey & Udry, 2000; Sowa, 1993).

The informal financial intermediaries operate effectively in the rural sectors of the economy where access to banking facilities is not available. For example according to International Fund for Agricultural Development (IFAD, 2000), Women are unable to have access to credit facilities from banks and also they have problems leaving their children and household duties long enough to travel to the bank. They therefore rely on Susu groups for assistance that could have been provided by the banks. Between 1990 and 1992 Susu collectors in Ghana increased significantly the size of their clientele. In Accra the mean number of depositors in a month per collector rose from 155 in 1990 to 221 in 1991 and 290 in 1992, a total of 48 percent over the period. Currently, there are more than 10,000 Susu collectors operating as individuals and companies in Ghana. As the number of depositors grew, so did average deposit size (Aryeetey & Udry, 2000). According to Soyibo (1994) individual savings collectors are the most significant informal savings mobilisers in terms of deposit size. They deposit all that they gather with formal financial institutions. In recent times

most rural banks have employed staff that move from house to house to collect deposits from customers, a system known as mobile banking. This is how the informal financial operation complements that of the formal financial operations.

The third form of informal financial service providers include saving mobilisers and lenders. Again, the susu operators are the key players in this segment. They mobilize savings on daily basis and lend out monies to deficit spending households and individuals. Their activities are claimed to be more risky because they sometimes use short term funds to finance long term projects causing asset-liability mismatch.

A comparison of the formal and informal financial sector characteristics will be important at this stage. The formal financial institutions ignore small farmers, lower-income households, and small-scale enterprises in favour of large-scale, well-off, and literate clientele, which can satisfy their stringent loan conditions. This shows that while level of education of the household head may be an important factor in determining the level of formal financial savings; it is likely that it may not influence that of informal savings so much. The level of education of the household head will also determine the ease or difficulty in accessing credit. Conversely, the informal financial sector provides savings and credit facilities for small farmers in rural areas, and for lower-income household and small-scale enterprises in the urban areas.

The formal sector is full of complex administrative procedures, which may be beyond the understanding of the rural masses and small savers. In the case of the informal financial units, the procedures may be simple and

straightforward; as they emanate from local cultures and customs, the rural people easily understand them.

Formal financial units are selective in terms of their clientele. This is probably to avoid clients who may make small deposits and cannot afford to provide the needed collateral. Contrary to this, the informal financial institutions accept any amount of regular savings, even the most modest, which a saver can afford to save. For example at most informal and semi-financial institutions such as susu companies and credit unions, a minimum deposit of GHc 5.00 is accepted from customers to open an account as account holder. In the informal financial units, access to credit is very simple, non-bureaucratic, and does not require too much documentation. Literacy in fact is not a prerequisite but recent development in the microfinance sector is likely to put emphasis on education and reading ability of clients. This is because MFIs are to submit regular returns to the Bank of Ghana on their operations as well as their clients.

In the case of formal financial institution, loan application procedures are very complex and require reading and writing skills before a file on the borrower may be established. Collaterals are also not required before loans are granted to members in the case in the informal financial units. In the formal financial units, collateral requirement correspond to the situation of relatively well-off urban dwellers: deposits or savings account in a commercial bank, or a property that can be mortgaged. This might probably be the reason why most rural agricultural households prefer saving with the informal financial units so they can easily have access to loan and credits to acquire farm inputs to expand their farms.

In the informal financial units collateral requirements on loans are subject to local conditions and borrowers' capacity. At times a mere guarantor (a known person in the community) is enough to qualify for credit assistance. In most cases the conditions may be based either on regular contributions to ROSCAs or on precise knowledge of farm size and or crops harvested so as to determine the borrower's capacity to repay the loan. The working days and opening hours of formal financial institutions do not take into account the rural work schedules. This is because banks are opened at times when farmers are at work in their fields. Even apart from this, farmers and poor market women do not have access to banks' services. Braverman and Huppi (1991) argue that the informal financial units have developed in rural areas because they have been providing faster services to their clients.

In Ghana for example the 139 branches of Ghana Commercial Bank are concentrated in the urban centres (Daily Graphic, 31st July, 2004). Chipeta and Mkandawire (1994) and Soyibo (1994) have expressed similar views that informal finance will do well so long as the economic activity demands increasing financial services for groups that cannot be reached by formal financial institutions. A typical informal savings in Ghana take forms such as giving credit to customers, relatives and friends. Such credits which represent savings for the giver are not guided by any formal conditions but the underlying factor is trust. The recipient is expected to pay back the credit at the end of the period agreed upon thus representing saved amount to the giver. Credit conditions (term, amounts, interest rate, and repayment schedule) vary according to the level of trust between individuals. According to Lacoste (2001) custom interest is not normally charged although in trade, there is usually

focused on different measures and aspects. Some of these definitions are briefly examined below:

Roubini and Bilodeau (2008) define financial developments as factors, policies, and institutions that lead to effective financial intermediation and markets, and deep and broad access to capital and financial services. This entails institutional and business environments, financial intermediaries and markets that provide basic support for a financial system. This results in efficient risk diversification and capital allocation and "outputs" of the financial intermediation process, such as availability of and access to capital. These factors, policies and institutions depend on a facilitating environment, structure, size, regulations and enforcement which when absent results in financial development that cannot be well implemented, improved or sustained.

Beck and Levine (2005) also explains that financial development takes place when financial instruments, markets, and intermediaries restructure the effects of information, enforcement, and transactions costs. Diverse types and combinations of information, enforcement, and transaction costs combined with different legal, regulatory, and tax systems have influenced financial contracts, markets, and intermediaries.

Different sets of indicators have been used in attempts to measure the financial development of economies. Starting in 1999, the World Bank began publishing a database on financial development and structure across countries. The most recent World Bank study updates and expands the financial development and structure database. This database has a selected number of financial system indicators (around thirty) including:

theory, the Conservative School, the Neo-Structural School, and the Information Asymmetry School.

The Liberal School

The traditional financial development literature is associated with the works of Schumpeter (1911), Patrick (1966), Goldsmith (1969), McKinnon and Shaw (1973) among others. Their basic premise emphasises the connection between a country's financial superstructure and economic development. Though the direction of the causal relationship has never been settled, the argument is that the services of the financial sector of reallocating capital to the highest use without substantial risk of loss through moral hazard, adverse selection, or transactions costs are a crucial catalyst of economic growth (Levine and Zervos, 1988). Typically, stagnant economic growth of developing economies was attributed to, inter alia, underdeveloped and repressed financial systems. The policy prescription of financial liberalisation proposed by McKinnon and others therefore places faith in undistorted markets as the principal mechanism that leads to macroeconomic stability, increased investment and growth. This is founded on the premise that goods and asset markets move towards stable adjustment under a freely operating price-clearing mechanism.

The assertion that finance plays a key role in bringing about economic growth has persisted in the literature. Levine (2005) building on a large body of theoretical and empirical research, argues that theory and evidence imply that better developed financial systems ease external financing constraints facing firms, which illuminates one mechanism through which financial development influences economic growth. Those in favour of deregulation argue that

financial institutions, as intermediaries, affect the level of savings and the distribution of investment funds positively and, therefore, encourage economic growth. The premise upon which this conclusion is based is perfect competition. Increased competition between financial institutions could lead to an efficient intermediation which may manifest with increase in investment activities brought about by reduction in interest rate premium. This would increase lending to the productive sector, ensures optimal credit allocation by channeling funds to the most feasible investment projects. The overall impact on economic development and welfare is positive.

An examination of the role of finance from several theoretical perspectives is imperative in order to discern how financial development aids corporate growth and economic development.

Patrick (1966) identified two distinguishing types of financial development: the "demand following" and "supply leading". In brief, the former refers to the phenomenon in which expansion in real economic activities induces demand for financial services; and the latter represents the case in which development in the financial system fosters real economic growth (Wa, 2002). Unfortunately, the direction of causality between finance and growth is still unclear. The debate on financial sector reform is invariably preceded by an examination of the theory of financial development and the relationship between financial intermediation and economic growth. Drawing from a rich literature spanning the pioneering works of Bagehot (1873) and Schumpeter (1911); Goldsmith (1969) argued that financial development correlates with growth. McKinnon and Shaw (1973) working independently, corroborate this view and added that developing economies are characterized by financial

repression, a policy induced to observe interest rate ceilings that are below market clearing levels, high reserve requirements, selective credit ceilings and capital controls to prevent the outflow of domestic savings. This ultimately acts as distortions in the financial system. Pagano (1993) demonstrates that financial development has a positive effect on economic growth by acting on the saving rate. Arguing in same direction, Rajan and Zingales (1998) reason that financial development may predict economic growth because financial markets anticipate growth.

Modigliani and Miller (1958) opined that there is a dichotomy between finance and investment, that is, corporate growth and investment are dictated by real variables such as productivity, demand for output, technical progress and relative factor prices of capital and labour. Finance, therefore, simply facilitates the investment process. This new is in a way supported by the neo-classical approach that sees a limited or modest role for capital in economic growth (Krugman, 1992). Other models in the neo-classical tradition include those of Galbis (1976), Kapur (1976), Mathieson (1980) and Fry (1988). Their conclusion is that economic growth can be raised by abolishing institutional interest rate ceilings, abandoning selectively targeted credit programmes, through the elimination of reserve requirement tax and by ensuring a competitive financial system that operates under conditions of free entry. Fry (1997) summarises this general view thus: under any conditions, neo-classical models find no benefit from financial repression.

Since the mid-1980s, financial liberalisation in several African countries has been implemented largely through on-going structural adjustment programs. As a prerequisite for financial liberalisation programmes,

stabilization policies have been designed to ensure macroeconomic stability, low inflation and reduced budget deficits. The focus has keen on liberalizing interest rates, deregulating the financial sector, strengthening the banking system, introducing new financial instruments, and developing the securities markets, in particular the capital market. Capital market is viewed as a medium to encourage savings, help channel savings into productive investment, and improve the efficiency and productivity of investments. Policy effectiveness, however, depends on the programmes put in place, and the will to ensure proper implementation. As observed by Ariyo and Adelegan (2005), the overall ability of financial markets to contribute to a country's sustainable economic growth and development will hinge on national policies and reforms. The emphasis on the growth of capital markets for domestic resource mobilisation has also been strengthened by the need to attract foreign capital in non-debt creating forms.

The role of interest rate in the determination of investment and, hence economic growth, has remained an unsettled issue in the literature. Similarly, what constitutes an appropriate interest rate policy still remains a puzzling question. Until the early 1970s, the main line of argument was that because interest rate represents the cost of capital, low interest rates would encourage the acquisition of physical capital (investment) and hence promote economic growth. Thus, during that era, policy of low real interest rate was adopted by many countries including the developing countries of Africa. This position was however, challenged by what is now known as the orthodox financial liberalisation theory.

The orthodox approach to financial liberalisation (McKinnon-Kapur and the broader McKinnon-Shaw hypothesis) suggests that high positive real

interest rates will encourage saving. This would lead, in turn, to more investment and economic growth, on the classical assumption that prior saving is necessary for investment. The orthodox approaches brought into focus not only the relationship between investment and real interest rate, but also the relationship between real interest rate and saving. It is argued that financial repression which is often associated with negative real deposit rates leads to the withdrawal of funds from the banking sector. Reduction in credit availability, it is argued, would reduce actual investment and hinder growth (Hussain, Mohammed & Kameir, 2002). According to the McKinnon-Shaw hypothesis, financial repression arises mainly when a country imposes ceilings on nominal deposit and lending interest rates at a low level relative to inflation. The resulting low or negative real interest rates discourage savings mobilisation and the channeling of the mobilized savings through the financial system. While the low and negative interest rates facilitate government borrowing, they discourage saving and financial intermediation, leading to credit rationing by the banking system with negative impacts on the quantity and quality of investment and hence on economic growth (Killick &Mwega , 1990).

An overview of the empirical findings in the literature has been comprehensively documented in Eschenbach (2004). In fact, the empirical evidence of the Mckinnon-Shaw hypothesis has been rather mixed, indicating that financial liberalisation alone is a necessary but not a sufficient condition for improving the economic performance of developing countries. The answer from economic theory to the question of what causes economic growth was incorporated in the endogenous growth literature of the 1990s. It emphasizes

the role of financial development in generating sustained growth through an external effect on aggregate investment efficiency.

Some authors have developed a framework for reciprocal externalities between the financial and the real sector. Much empirical support has been found for the "finance promotes growth" view, but time-series evidence is less clear-cut than broad cross-section analysis. Majority of studies, however, concluded that finance induces growth in early stages of economic development and vice versa in more advanced stages. A lot of evidence for bi-directional causality has been found as well. A specific role has been attributed to stock markets, but here in particular, the evidence is mixed. It seems that individual countries have to be studied deliberately and that general conclusions have to be treated with caution. It is this type of conclusion by Eschenbach (2004) that strengthens specific country studies like this one.

The Conservative School

The post-Keynesians (e.g., Paul & Dutt, 1991) argue that financial liberalisation though raising the real deposit rate may lead to a fall in output and growth, and subsequently to financial instability. A rise in the real deposit rate increases the supply of deposits and hence loans, with the marginal propensity to save increasing. Consequently, aggregate demand and output will fall, with profits and investment also falling in the long run. If accelerator effects of investment are introduced, then the fall in output and growth will be greater. Robinson (1952), for example, argues that the financial system does not spur economic growth; rather the financial system simply responds to development in the real sector. Lucas (1988a) dismisses finance as a major determinant of

economic growth and Greenwood and Jovanovic (1990) observe that the dynamics of financial development resembles a demand-following approach which implies that finance is passive and hence financial markets develop out of market needs. Financial regulation also has support in Arestis and Demetriades (1991) who argue that financial liberalisation does not impact on financial market efficiency and the allocation of investment.

Again the doctrine of regulation and deregulation has remained somewhat controversial in finance and economic literature especially in the case of developing countries. According to Aryeetey and Fosu (2003), it is obvious that while the taking over of the financial markets by the state, as occurred prior to reforms, cannot be the best means to make finance respond to the developmental needs of poor economies, outright' liberalisation (deregulation) of markets with significant institutional and structural inadequacies also cannot lead to the desired outcomes. This, they claims, is clearly shown by the African experience of the 80s and 90s.

It is yet to be fully settled as to whether developing countries should adopt regulatory or deregulatory policies in the financial sector in order to achieve desired level of growth and development. Even empirical evidence has not produced any consensus. This notwithstanding, several countries of the world have increasingly moved towards financial deregulation or liberalisation over time.

However, financial deregulations and financial liberalisation in particular, have been at the root of many recent cases of financial and banking crises. In Ghana, banking crises occurred in the 90s with a number of banks becoming distressed following financial sector reforms. In Asia, financial crises

of serious global implications occurred in late 90s. In general, a number of studies have been carried out on financial and banking crises (Arestis & Demetriades, 1991; Diaz-Alejandro, 1985; Gibson & Tsakalotos, 1994; Paul & Dutt, 1991). In fact, studies (Demirgüç -Kunt and Detragiache, 1998) based on 53 countries for the period 1980-1995, have shown that banking and financial crises are more likely to occur in liberalised financial systems (see also, Caprio & Klingebiel, 1999). This result is supported by Kaminsky and Reinhart (1999), who argue that banking sector problems precede currency crises with the latter helping to deepen banking crises in a vicious circle. Arestis (2006) asserts that financial reforms in many countries allowed real interest rates to reach levels exceeding 20 percent per annum in some cases, and in other cases banking and financial crises led to currency crises.

The Neo-Structuralists School

As discussed in Aryeetey and Fosu (2003), the structuralists question the neo-classical assumptions underlying the economic analysis in the McKinnon-Shaw framework. Their work essentially focuses on the importance of non-institutional finance in the form of money lenders and indigenous bankers, which was not considered in the McKinnon-Shaw framework. Economists in this tradition include Buffie (1984), Kohsaka (1984), and Van Wijnbergen (1983). Perhaps, the most important insight that the neo-structuralist work brings to financial development modeling is the importance of non-institutional finance or curb market. Indeed, the absence of curb markets in the McKinnon-Shaw models represents a serious lacuna (Fry, 1988). The Structuralists are of the opinion that there are structural impediments to the well-functioning of the financial systems in developing economies. In fact, a prominent feature in these

models is the prevalence of informal financial markets which use Tobin's (1965) portfolio framework for household sector asset allocation. The assumption is that households allocate its assets along currency or gold, bank deposits and curb market loans. With increase in deposit rate of interest which financial liberalisation or deregulation engenders, the demand for bank deposit will rise while the demand for curb market loans will decline. The implication here is a reduction in the total supply of working capital in the curb market and a rise in interest rate. The argument of the structuralists' school thus is that high interest rate results in inflation in the short run through a cost-push effect. This lowers the rate of economic growth simultaneously through the reduction of supply of credit in real terms to finance investment. The immediate implication of this is a reduction in the rate of economic growth.

Despite the claims of financial deregulation policies as panacea for financial repression and as catalyst for economic growth and development, the experiences of some LDCs seem contradicting. Empirical studies by Diaz-Alenjandro (1985) and Honohan and Atiyas (1989) conducted on Chile, Argentina, Uruguay and Turkey; suggest that deregulatory policies have no positive effects on these economies. Rather, the economies performed better during the regulatory periods. This is basically the argument of the conservative school. To them, the economies of the LDCs including sub-Saharan African countries' economies (SSACs), to which Ghana belongs, are not ready for elaborate liberalism due to structural realities, institutional breakdown and inefficiencies that characterise them. They are of the opinion that financial liberalism as a strategy can bring about veritable dividend only to developed and stable economies. Their contention is that SSACs can be better off with

repression until their economies reach a stage of appreciable growth and development before liberalisation can be fully entrenched to advantage. This argument has support in Oladipo (2000), who contends that some countries achieved limited degrees of success while for others the benefits were at best illusionary. He, therefore, suggests the following as pre-conditions for achieving the desired results:

(a) Adequate prudential regulation and supervision of commercial bank implying some minimal levels of accounting and legal infrastructure.

(a) Macroeconomic stability and an appropriately valued exchange rate (since overvaluation leads to an upward shift in the consumption function).
(b) Fiscal discipline taking the form of substantial government borrowing requirements that avoid inflationary expansion of reserve money by the central bank.
(c) Tax system that does not impose discriminatory explicit taxes on financial intermediation.

Ikhide and Alawode (2001) also argue along the same line. Their study using discriminant analysis demonstrates that the health of banks deteriorated following reforms in Nigeria. They cautiously identify wrong sequencing process as a major factor in the poor performance of the financial sector reforms. The foregoing discussion on liberal and conservative views seems to agree with the experience in developing countries. In fact, liberal and conservative views are responsible for policy-mixes (inconsistencies) which occupy the centre stage of government decision on economic matters in developing countries including Ghana.

The Information Asymmetry School

Following Aryeetey and Fosu (2003), the imperfect or asymmetric information school examines the problems of financial development within the context of information asymmetry and costly information that results in credit rationing. Modern analysis of credit markets from the perspective of imperfect information theory dates back from Jaffee and Russell (1976), Keeton (1979), and Stiglitz and Weiss (1981).Their models of credit rationing rely on imperfect information, although the exact mechanisms emphasised by different authors such as adverse selection, moral hazard, or monitoring costs vary. The implication of some of these models is that in some circumstances lenders expected profits will decline with an increase in the interest rates charged to borrowers. Thus, in the presence of imperfect information and costly contract enforcement, market failures result from adverse selection and. moral hazards which undermine the operation of financial markets (Hoff & Stiglitz, 1990). To the imperfect information school, state intervention in financial markets is desirable under certain circumstances; particularly where the intervention is geared towards removing the prevailing problem of information asymmetry and transaction costs (Stiglitz & Weiss, 1981).

A distinction also exists between fragmented markets and parallel markets (Roemer & Jones, 1991), with parallel markets emerging to evade government controls and regulations and fragmented markets being the result of inherent operational characteristics. It is these features that made Aryeetey and Nissanke (1998) to conclude that the imperfect information school deals with fragmentation while the financial repression school is concerned with parallelism.

There are numerous, studies on regulation, deregulation, reforms, monetary policy, other development finance topics and their implications for the operations of financial institutions. Some of these studies can be referred to those of Soyibo and Adekanye (1992), Soyibo (1994), Isijola (2000), Adebiyi (2000), Ajakaiye and Odusola (1995) and Sani and Yakpogoro (1997).However, in all these, the outcome has remained mixed. Financial deregulation has dictated policies that tended to remove lids incipiently placed on interest rates, reserve requirements, licensing and entry, credit ceilings and preferred lending, and branch networking among others (Ezirim, Emenyonu & Muoghalu, 2002). However, Versluysen (1998) has listed financial liberalisation measures to include removal' of restrictions on interest rates ceiling, policies aimed at enhancing competition in the financial sector, improving the functioning of the securities market, increasing the transparency of financial transactions, and harmonizing and/or simplifying the standards of prudential provision. In his opinion, these measures have remained common policy prescriptions for developing countries undergoing reforms.

The summary of the foregoing discourse is that at the theoretical level, two schools of thought: the liberalists and the conservatives -have emerged. The liberal school is of the pinion that financial deregulation is key to eradicating the condition of financial repression in the financial sector of the economy for the economy to stand a better chance to grow and develop to appreciable levels than otherwise. The proponents of this school are McKinnon (1973) and Shaw (1973). Financial repression sets in when the government, through its monetary authorities, evolves and pursues policies that disturb the efficient functioning of the domestic financial system. This causes returns on financial assets to fall

more than the market forces would permit and shifts the ^allocation of available resources (such as in the case of credit transactions) from the Market forces to the government. It can equally be described as the distortive tendencies existing in domestic financial markets caused by such measures as the imposition of ceilings on credit expansion and interest rates, selective allocation of credit and high reserve requirements. According to Adebiyi (2000) and Isijiola (2000), the implication is that financial repression is identified with regulator structures and policies. Financial liberalism which characterises the deregulatory reforms is recognised to be the expected solution to financial repression.

Many scholars have decried repression and argued for liberalisation in LDCs. They include Fry (1978), McKinnon and Shaw (1973), Ikhide (1990), Carbo and Rojas (1991), IMF (1993), Carprio and Summers (1993), and Athukorala and Rajapatirama (1993). Their contention is that regulatory policies are misguided and have caused serious damages to the economy of many LDCs by reducing savings and encouraging investments in unproductive and inefficient activities, misallocation of loanable funds, and fragmentation of their economies. To this end, financial liberalisation enhances efficiency in resource mobilisation and allocation, and this aids in correcting the supply - demand imbalance in the economy of LDCs (Isijiola, 2000).It is also contended that financial liberalisation eliminates condition of financial dualism that thrives under financial regulation.

Ikhide (1990) and Adebiyi (2000b) are of the opinion that the elimination of financial dualism and associated problems imply a shift from financial repressive (regulatory) to financial liberalisation (deregulatory) policies.

To this end and from the broad theoretical expositions presented above which generally reviews the literature on various economic traditions, our next task is to gradually narrow down to a specific model as a platform on which the current study revolves. Given the various theoretical discourses in general and in view of the foregoing and based on the future of Ghanaian economy in particular, it is the liberal economic paradigm that the study adopts and serves as the springboard to situate the current study. In fact, Ghana's financial system along with the whole economy is tuned towards the direction of a liberal economic system. In particular, the financial system is positioned to contribute significantly towards growth in general by acting as a source of credits for investment. This is because since the 1983 Ghana had adopted Economic Recovery Programme (ERP) and Structural Adjustment Programme (SAP) with financial sector liberalisation as one of the key components in 1988.Its basic characteristics or assumptions are based on McKinnon-Shaw framework. As a precondition, stabilisation policies were put in place to ensure macroeconomic stability. Thus, interest rates were liberalised, financial sector was deregulated with banking system opened and strengthened through the introduction of new financial instruments as well as the development of securities market, particularly the capital market. In fact, the capital market complements the banking system as a medium to encourage savings and channel same into productive investment: Thus, capital market for domestic resource mobilisation is also important in attracting foreign capital in non-debt creating forms.

Thus, the liberal economic paradigm explains the relationship between growth and financial development in general. However, it does not completely

replicate the Ghanaian reality the level of development of the financial system in Ghanaian particular and structure the whole economy in general. The liberal theoretical framework, in its compact form, simply reflects the direct relationship between growth and financial development as well as other control variables. It does not reflect the various interrelationships and channels through which financial development affects economic growth. .While the framework as it is, can explain the supply-leading and demand-following hypotheses of the link between financial development and growth in terms of causation, it is handicapped in capturing the various channels through which either the supply-leading and demand-following hypotheses work in the whole economy.

Despite this, it constitutes the theoretical basis on which this study is situated. This is keeping with the tradition of McKinnon and Shaw (1973) that provided the theoretical foundations for widespread adoption of financial liberalisation and reform measures especially in developing countries. Another important reason for adopting the liberal model lies in the fact that it has the highest potential for the development of the financial system. The other alternative models: the conservative, the neo-structuralists and the information asymmetry models are not particularly suited for the current study because of their individual characteristics, and in some cases, the data challenge they pose. For instance, the conservative school holds that financial system does not stimulate economic growth, rather, it responds to developments in the real sector. The basic characteristics of this model which alienate it from the focus of this study are as follows:

The model is associated with intensive financial repression in which governments attempt to fix interest rates below market levels and control the

allocation of credit through directive or ownership of banks. There is also high reserve requirement and entry restriction into the financial system. The main drawback is that it leads to a progressive deterioration of economic performance with contraction of financial system leading to low efficiency in lending and collection operations.

Financial repression may lead to misallocation of funds, with credit often flowing to inefficient public enterprises and to favoured private borrowers. Projects with higher returns use self-financing, experience credit squeeze and forgo efficient technology. The consequences are widespread bank insolvency.

In addition, the poor performance of the real (particularly agricultural) sector of the Ghanaian economy over the years could not have provided the basis for the development of the financial sector as the demand-following hypothesis suggests. Also, the weak infrastructural and institutional base of the economy could not provide the framework to situate our study on the conservative hypothesis. Thus, anchoring this study on the position of the conservative school would be counterproductive.

The neo-structuralist paradigm would also not provide a suitable framework for this study as its focus is on the importance of non-institutional finance and market segmentation. In Ghana, the size of the informal financial sector, though significant in terms of its contribution to the rural economy in particular and the aggregate economy general, is not known. Data availability, would understandably, be a major challenge in this area.

Information asymmetry school could not be adopted because of the inherent contradictions associated with it. The imperfect information school holds that state intervention in financial markets is desirable under certain circumstances

if geared towards removing prevailing problems of information asymmetry and transaction costs. Ghana has recorded minimal successes in economic matters that involve direct state intervention. Therefore, by advocating state intervention and given her history of the performance of state involvement in economic activities, we assume that the model is unsuitable for our study.

In order to link macroeconomic outcomes with microeconomic fundamentals and decisions, we adopt a simple modified endogenous growth model that explains the relationship between financial development and growth. The phrase "endogenous" embraces a diverse body of theoretical and empirical work that emerged in the 1980s and distinguishes itself from the neo-classical growth model. The study draws its framework extensively from Roubini and Sala-i-Martin (1992) and 'Aka (2003).

Theories and Determinants of Economic Growth

Neoclassical Theory of Economic Growth: Solow-Swan (1956) Model

The conventional economic growth theorisation begun with the neoclassical model of Ramsey (1928), Solow (1956) and Swan (1956),and Koopmans (1965). A great deal of modern theoretical and empirical work on economic growth is based on the neoclassical growth model. The widespread application of the neoclassical model is rooted in the important role it plays in coordinating and integrating various works in macroeconomics, public finance and international economics. As a consequence, neoclassical growth model enjoys a wide application in macroeconomics, and in other applied economics.

The basic assumptions of the Solow (1956) and Swan (1956) model are: constant returns to scale, diminishing marginal productivity of capital,

exogenously determined technical progress and substitutability between capital and labour. As a result, the model highlights the savings or investment ratio as important determinant of short-run economic growth. The Solow-Swan growth model predicts that in steady-state equilibrium the level of GDP per capita will be determined by the prevailing technology and the exogenous rates of saving, population growth and technical progress. They conclude that different saving rates and population growth rates might affect different countries' steady-state levels of per capita income. That is, other things being equal, countries that have higher saving rates tend to have higher levels of per capita income, and vice versa. Technological progress, though important in the long-run, is regarded as exogenous to the economic system and therefore it is not adequately examined by this model.

Further, on the issue of convergence or divergence, the model predicts convergence in growth rates on the basis that poor economies will grow faster compared to rich ones. If all economies were intrinsically the same, except for their starling capital intensities, then convergence would apply in an absolute sense; that is, poor countries would tend to grow faster than rich ones. However, if economies differ in various respects —including propensities to save and have children, willingness to work, access to technology, and government policies, then the convergence force applies only in a conditional sense. The growth rate tends to be high if the initial per capita GDP is low in relation to its long-run or steady state position; that is, if an economy begins far below its own target position. For example, a poor country that also has a low long-term position; possibly because its public policies are harmful or its saving rate is low would not tend to grow rapidly. The convergence property derives in the neoclassical

model from the diminishing returns to capital. Economies that have less capital per worker (relative to their long-run capital per worker) tend to have higher rates of return and higher growth rates. The convergence is conditional because the steady-state levels of capital and output per worker depend, in the neoclassical model, on the propensity to save, the growth rate of population, and the position of the production function - characteristics that may vary across economies. Recent extensions of the model suggest the inclusion of additional sources of cross-country variation, especially government policies with respect to levels of consumption spending, protection of property rights, and distortions of domestic and international markets.

The concept of capital in the neoclassical model can be usefully broadened from physical goods to include human capital in the forms of education, experience, and health. (see Barro & Sala-I-Martin, 1995; Caballé & Santos, 1993; Lucas, 1988b; Mulligan & Sala-i-Martin, 1993; Rebelo, 1991). The economy tends toward a steady-state ratio of human to physical capital, but the ratio may depart from its long-run value in an initial state. The extent of this departure generally affects the rate at which per capita output approaches its steady-state value. For example, a country that starts with a high ratio of human to physical capital (perhaps because of a war that destroyed mainly physical capital) tends to grow rapidly because physical capital is more amenable than human capital to rapid expansion. A supporting force is that the adaptation of foreign technologies is facilitated by a large endowment of human capital (see Benhabib & Spiegel, 1994; Nelson & Phelps, 1966). This element implies an interaction effect whereby a country's growth rate is more sensitive to its starting level of per capita output the greater is its initial stock of human capital.

Again, neoclassical model, even when extended to include human capital, predicts that, in the absence of continuing improvements in technology, per capita growth must eventually cease. This prediction, which resembles those of Malthus (1798) and Ricardo (1817), comes from the assumption of diminishing returns to capital. The long-run data for many countries indicate, however, that positive rates of per capita growth can persist over a century or more and that these growth rates have no clear tendency to decline, Barro (1996).

However, in the 1950s and 1960s, growth theorists recognised this modeling deficiency and usually correct it by assuming that technological progress occurred in an unexplained (exogenous) manner. This device can reconcile the theory with a positive, possibly constant per capita growth rate in the long run, while retaining the prediction of conditional convergence. The obvious shortcoming, however, is that the long-run per capita growth rate is determined entirely by the rate of technological progress that comes from outside of the model. (The long-ran growth rate of the level of output depends also on the growth rate of population, another element that is exogenous in the standard theory.) Thus, conclude with a model of growth that explains everything but long-run growth, an obviously dissatisfactory conclusion.

Endogenous Growth Theories

Given the empirical and policy problems associated with the Solow model, a number of new models which attempt to endogenise the growth process have been approved. The dependence of growth on exogenous technological progress in the neoclassical growth model and the apparent inconsistency of the

"unconditional convergence" hypothesis led to the renewed search for alternative models that can generate economic growth endogenously. The major proponents are Grossman and Helpman (1990), Jones (1995) and Lucas (1988a).

Endogenous growth theory means economic growth from within a system (usually a nation/state). Endogenous growth theory stresses the fact that if productivity is to increase, the labour force must continuously be provided with more resources. Resources in this case include physical capital, human capital and knowledge capital (technology).

The role of technological progress as a key driver of long-run economic growth has been revisited in more recent studies, which accepts constant and increasing returns to capital. The endogenous growth theories propose that, the introduction of new factors, such as knowledge, innovation, etc., will induce self-maintained economic growth. Recent growth theorists dismiss the Solow-Swan model in favour of an endogenous growth model that assumes constant and increasing returns to capital. The critics allege that the standard neoclassical model fails to explain the observed difference in per capita income across countries. Recent work on endogenous growth theory has therefore, sought to supply the missing explanation of long-run growth in the neoclassical model. In the main, this approach provides a theory of technical progress, one of the central missing elements of the neoclassical model. The inclusion of a theory of technological change in the neoclassical framework is difficult, however, because the standard competitive assumptions cannot be maintained.

Technological advancement involves the creation of new ideas, which are partially non-rival and therefore have aspects of public goods. For a given

technology, that is a given state of knowledge, it is reasonable to assume constant returns to scale in the standard, rival factors of production, such as unskilled labor, broad capital, and land. But then, the returns to scale tend to be increasing if the non-rival ideas are included as factors of production. These increasing returns conflict with perfect competition. Moreover, the compensation of non-rival old ideas in accordance with their current marginal cost of production - zero - will not provide the appropriate reward for the research effort that underlies the creation of new ideas.

Other Growth Theories

Arrow (1962) and Sheshinski (1967) constructed models in which ideas were unintended by-products of production or investment, a mechanism described as learning-by-doing, in these models, each person's discoveries immediately spilled over to the entire economy, an instantaneous diffusion process that might be technically feasible because knowledge is non-rival. Romer (1986) showed later that the competitive framework can be retained in this case to determine an equilibrium rate of technological advance, but the resulting growth rate would typically not be Pareto optimal. More generally, the competitive framework breaks down if discoveries depend in part on purposive R&D effort and if an individual's innovations spread only gradually to other producers. In this realistic setting, a decentralized theory of technological progress requires basic changes in the framework to incorporate elements of imperfect competition. These additions to the theory did not come until Romer's (1987, 1990) research in the late 1980s.

The initial wave of the new research —Romer (1986), Lucas (1988b), Rebelo (1991)—built on the work of Arrow (1962), Sheshinski (1967), and Uzawa (1965) and did not really introduce a theory of technological change. In these models, growth may go on indefinitely because the returns to investment in a broad class of capital goods, which includes human capital, do not necessarily diminish as economies develop spillovers of knowledge across producers and external benefits horn human capital are parts of this process, but only because they help to avoid the tendency for diminishing returns to capital This idea goes back to Knight (1944).

The incorporation of R&D theories and imperfect competition into the growth framework began with Romer (1987) and includes significant contributions by Aghion and Hewitt (1992) and Grossman and Helpman (1991), Barro and Sala-i-Martin (1995) provide expositions and extensions of these models. In these settings, technological advance results from purposive R&D activity, and this activity is rewarded, along the lines of Schumpeter (1934), by some form of *ex-post* monopoly power. If there is no tendency to run out of ideas, then growth rates can remain positive in the long run. The rate of growth and the underlying amount of inventive activity tend, however, not to be Pareto optimal because of distortions related to the creation of the new goods and methods of production. In these frameworks, the long-term growth rate depends on governmental actions, such as taxation, maintenance of law and order, provision of infrastructure services, protection of intellectual property rights, and regulations of international trade, financial markets, and other aspects of the economy. The government therefore has great potential for good or ill through its influence on the long-term rate of growth.

Again, motivated by Romer's (1986) and Lucas' (1988b) seminal studies, work within the endogenous growth framework highlighted three significant sources of growth: new knowledge (Grossman & Helpman, 1991; Romer, 1990), innovation (Aghion & Howitt, 1992) and public infrastructure (Barro, 1990). As a result, and in contrast to the neoclassic counterpart, policies Romer presented a formal model that yields positive, long run growth rates on the basis of technological progress driven by the role of externalities, arising from learning by doing and knowledge spillover. Lucas introduced a model in which human capital plays a fundamental role in perpetuating economic growth and preventing diminishing returns to physical capital accumulation. It is important to note that these factors have already been identified in the literature before, but it is the first time that they are formalised and modelled are deemed to play a substantial role in advancing growth on a long-run basis. Turning to the convergence-divergence debate, the endogenous growth models suggest that convergence would not occur at all (mainly due to the fact that there are increasing returns to scale).

However, one deficiency of the early versions of endogenous growth theories is that they no longer predicted conditional convergence. Since this behavior is a strong empirical regularity in the data for countries and regions, it was important to extend the new theories to restore the convergence property. One such extension involves the diffusion of technology (see Barro & Sala-I-Martin, 1995). Whereas the analysis of discovery relates to the rate of technological progress in leading-edge economies, the study of diffusion pertains to the manner in which follower economies share by imitation in these

advances. Since imitation tends to be cheaper than innovation, the diffusion models predict a form of conditional convergence that resembles the predictions of the neoclassical growth model. Therefore, this framework combines the long-run growth of the endogenous growth theories (from the discovery of ideas in the leading-edge economies) with the convergence behavior of the neoclassical growth model (from the gradual imitation by followers).

Endogenous growth theories that include the discovery of new ideas and methods of production are important for providing possible explanations for long-term growth. Yet the recent cross country empirical work on growth has received more inspiration from the older, neoclassical model, as extended to include government policies, human capital, and the diffusion of technology. Theories of basic technological change seem most important for understanding why the world as a whole can continue to grow indefinitely in per capita terms. But these theories have less to do with the determination of relative rates of growth across countries, the key element studied in cross-country statistical analyses,

Another strand of literature, perhaps less influential is the growth theory of cumulative causation developed by Myrdal (1957) and Kaldor (1970). Essential to this theory is the argument of 'cumulative causation' in which initial conditions determine economic growth of places in a self-sustained and incremental way. As a result, the emergence of economic inequalities among economies is the most possible outcome. Although there are centrifugal effects (positive spillovers) spreading growth from the more to the less advanced economies, they are incapable of bringing the system into a state of balance if market forces alone are left at work. In other words, economic policy has to

come into play to correct those imbalances. In contrast to theories mentioned above, theories of cumulative causation has a medium term view and often described as "soft" development theories due to a lack of applied mathematical rigour (Plummer & Taylor, 2001). However, certain similarities are evident between the cumulative causation approach and the theory of endogenous growth.

Similarly to the cumulative causation theory, New Economic Geography (NEG) asserts economic growth tends to be an unbalance process favouring the initially advantaged economies (Fujita, Krugman, Venables, & Fujita, 1999; Krugman, 1992). However, in contrast to the former, this strand of literature develops a formalised system of explanations which places explicit emphasis on the compound effects of increasing returns to scale, imperfect competition and non-zero transportation costs. Central to this theory is that economic activity tends to agglomerate in a specific region and choose a location with a large local demand resulting in a self-reinforcing process. The spatial distribution of economic activity can be explained by agglomeration (or centripetal) forces and dispersion (or centrifugal) forces. The former include backward and forward linkages of firms, externalities and scaled economies while the latter include negative externalities, transportation costs and intensification of competition. Consequently, NEG is mainly concerned with the location of economic activity, agglomeration and specialization rather that economic growth. However, growth outcomes can be inferred from its models. From a more macro perspective, other theoretical approaches have emphasised the significant role non-economic factors (at least in the conventional sense) play on economic performance. Thus, institutional economics has underlined

the substantial role of institutions (Jutting, 2003; Matthews, 1986; North, 1990), economic sociology stressed the importance of socio-cultural factors (Granovetter, 1985; Knack & Keefer, 1997), political science focused its explanation on political determinants (Brunetti, 1997; Lipset, 1959) and others shed light on role played by geography (Gallup, Sachs, & Mellinger, 1999) and demography (Brander & Dowrick, 1994; Kalemli-Ozcan, 2002).

Theories of Poverty

The Individualistic Theory of Poverty

The individual, according to this theoretical perspective, is the cause of her/his poverty because she or he is lazy. This perspective grew out of the belief in the colonial days that poverty was the 'natural result of individual defects in aspiration or ability (Schiller 1998). The individualistic theorists draw on the argument that through hard work and informed choices, the poor could have avoided (and now can remedy) their problems. Others within this theoretical lineage, aside from the laziness labelled against the poor, attribute the cause of poverty to the low intelligence of the poor (Bradshaw, 2006)

Beliefs of this nature partly accounted for the emergence of the Eugenics Movement or Puritanical Humane Society in the nineteenth century. The Eugenics movement advocated the need to sterilise individuals who possess limited abilities. Green and Hulme (2005) referred to Douglas's (1991) essay on the link between leprosy and poverty in medieval England when leprosy was regarded as a contagious disease warranting the expulsion of lepers. A belief that was influenced largely by changes in social attitudes, particularly changes in tolerance towards the poor. This is because there was no increase in mortality

conviction that with the appropriate measures, the 'lazy' poor people who are supposedly poor due to their laziness can be purged of their laziness.

Again, this current study believes that individuals who are labelled as being lazy may be lazy because they are socially excluded from the much-needed means, which smothers their innate initiatives, to attain their goals. This issue forms the theoretical premise of the next theory to be discussed, that is the culture of poverty. In this light, the 'lazy individuals' must be identified and assisted with capital and other essential opportunities to either commence a trade or learn a profession and could be assisted regularly. As noted by Schiller (1998, p. 3), theories of sin and morality did not fare well in this modern era. For that reason, 'motivation' or work ethic' for the poor is much emphasised.

Subjecting the individualistic theory to a theological explanation, some theorists argued that people who found themselves in unfortunate conditions, for instance, the blind, cripple and lepers including the poor, are atoning for the sins or the sins of their parents. Contrasting this, they argued further that those who are wealthy (including, of course, good health) are those favoured by God. In assessing this argument, the researcher agrees that it is true that God favours some above others. However, the so-called favours and misfortunes could be trials in disguise to determine who the genuine servants are among His creatures.

In other words, these 'favours' and 'misfortunes' may constitute divine tool most probably to sieve the grains. Man, therefore, must be circumspect in such conditions. Consequently, God exhorts those who have been favoured (in the context of the current study the non-poor) to share their blessings (wealth) with the less fortunate (the poor).

Further on the individualistic theory, the neoclassical economists argued that all people have their set of abilities to be able to maximise their well-being by investing in those abilities. If some individuals chose and acted otherwise which failed to improve their well-being, then such individuals, according to the economic concept of human capital, should be held solely responsible for their predicament (Schiller, 1998, p. 3). For instance, attending college to get the degree has been seen as investing in one's productive capabilities. As convincing as the human capital theoretical argument may appear, one must not be oblivious of the fact that there is hardly any attempt to level the playing ground both within countries and among countries for individuals to have equal access to livelihood opportunities. This study argues that these socially and economically generated inequalities have largely condemned more people to recurrent poverty. Therefore, there is a dire need to ensure an ethnically based redistribution of both the national and global cakes within countries and across countries. How possible can this be? The current study has explored this segment.

The Culture of Poverty

The 'culture of poverty' was coined by Oscar Lewis, an American Anthropologist in 1959 through a study conducted on the urban poor in Mexico and Puerto Rico. The culture of poverty argues that the poor cultivate certain values and norm that stifle their motivation and desire to escape poverty (Schiller 1998, p.115). People's culture is not only about their behavioural aspect but also about the values, norms and aspirations of their behavioural system. That said, culture of poverty could then be explained as the behavioural

characteristics that make it extremely hard for a particular people to escape the clutches of poverty. These characteristics are capable of being transmitted from generation to generation.

Unlike the individualistic theory, theorists who towed the line of the culture of poverty placed the blame squarely upon the dominant culture of society that allows the growing of such subculture. The poor, according to this perspective, are the unwilling victims of a dysfunctional dominant culture. The culture of poverty is nurtured by certain special conditions such as 'an economic setting of cash economy, a high rate of unemployment and underemployment, low wages, and people with low skills' In the absence of any voluntary or state support and stable family, the low-income class tends to develop the culture of poverty against the dominant ideology of accumulation of the middle class (Islam 2005) In that light, Leacock (1971) put culture of poverty simply as the 'mold which produces a uniform set of characteristics in those growing up under its influence'.

People with this culture are more likely to feel marginalised, helpless and inferior and can cultivate a habit for the present (Black's Academy 2002, p. 2). This is because these people are faced with chronic poverty and have remained poor for a greater part of their life and may transmit their poverty to subsequent generations (Hulme & Shepherd 2003). The main argument in this theoretical perspective may be summarised as follows: the culture of poverty begets perpetual poverty.

As evident in Oscar Lewis' words: Once the culture of poverty has come into existence, it tends to perpetuate itself from generation to generation because of its effect on children. By the time slum children are six or seven, they have

opportunity'. Schiller (1998) argued that the poor are poor because the system has discriminated against them. Such people had little access to education, jobs, housing, etc. They get no tax breaks and many of the public goods and services. In the wake of such extreme external barriers or structural bottlenecks, little chance is available for the poor to escape poverty.

According to Hickey and Bracking (2005), the persistence of poverty is an indication of its institutionalisation within the social and political norms and institutions, and its legitimisation within the political discourse. As a remedy, Hickey and Bracking (2005) called for the allocation or reallocation of resources and the shifting of power relations within which chronic poverty is embedded.

With particular reference to rural poverty, Richardson Jr and London (2007) posited that the relationship between poverty and structural inequities is not accidental or incidental but structural and causal. For the solution, they called for breaking these barriers first to be followed by building rural economies. However, Oliveira (2002) has made it clear that fighting structural poverty seeks to only strengthen the capacity of the poor to fend for their livelihoods, but not to turn people into passive and permanent beneficiaries of assistance programmes.

The structural theory of poverty has its roots in the Marxist doctrine in which the argument that the existence of low-income class is the creation of the capitalist economic system, or the bourgeoisie, as a strategy for dominance. This calls for the interventions of governments largely to provide a level playing ground for the equitable and justifiable wealth acquisition and redistribution.

Geography of Poverty

Attempts to theorise poverty along the line of geographical disparities led to the emergence of geography of poverty. Referring to Adam Smith's hypotheses in his Wealth of Nations, Sachs and Warner (2001) noted that in addition to Smithian view that governments must pursue free-market economic policies; he also acknowledged the importance of physical geography of regions in their economic growth. He is believed to have argued that due to easy access to sea trade, the economies of coastal regions relatively performed better than the economies of the inland areas. Empirically testing this hypothesis, Sachs et al. (2001) found positive association between geography and the distribution of world income and economic growth.

The use of geographical disparities in poverty analysis presupposes the concentration of poverty in some particular areas, communities, localities within countries and among regions in the world. Some explanations given about the factors responsible for poverty include 'disinvestment, proximity to natural resources, density, diffusion of innovation and other factors (Smith, 1973, pp. 57–64 cited by Bradshaw 2006). The economic agglomeration theory explains that 'strong industrial clusters' emerge because of the ability of similar firms in proximity to pull supportive services and markets, which further attracts more firms.

Similarly, the proximity of poverty conditions creates widespread poverty. The attraction of businesses and firms away from other locations to particular locations presupposes the likely impoverishment of the 'other locations'. For example, low housing prices in such impoverished locations may attract more poor people, thereby leading to housing disinvestment by building

owners. In an empirical study entitled Geography of Poverty and Wealth in Great Britain, Green (1994) concurred that through the geographical perspective, the salient variations in the degree and extent of poverty and wealth between different regions and different sizes of urban areas become apparent. Thus far, one can understand quite clearly why the state has to intervene from time to time to ensure that the distribution of industries and firms in the countries is not geographically skewed heavily. This can be achieved by using tax incentives partly to attract some industries to certain areas within the country.

A policy can be utilised among the sub-Saharan countries to grant tax reliefs to certain strategic and labour-intensive industries to enable them provide jobs for the unemployed. Most of the poor people would have acquired incomes, thereby escaping the poverty trap.

Furthermore, and with particular reference to the Central Place Theory, 'the lack of infrastructure that allows development of human resources [at any given place or area] limits economic activity that might use these resources' (Bradshaw, 2006). It has long since become a conventional belief that 'advantaged areas stand to grow more than disadvantaged areas even in periods of general economic growth'. Solutions suggested to deal with poverty associated with geographical disparities favoured tackling the main factors that precipitate "decline indepressed areas'

The Cyclical Theory of Poverty

The cyclical poverty has been explained as poverty that may be widespread; however, the duration of its occurrence is short-lived (Inc, 2008). This kind of poverty occurs when individuals or households suddenly are unable

Financial Development and Economic Growth Nexus

A financial sector that is well developed and functioning efficiently and effectively plays a major role in the economic growth and development process of a country. Financial development is important for a wide range of reasons and this section focuses on the two most important benefits of financial development, economic growth and poverty reduction. Economic growth is one of the main benefits that have been linked to financial development. Economic growth to a large extent is dependent on investment and more often than not a large number of investments are channelled through the financial sector. A fairly large number of researchers have shown that financial development leads to economic growth through means such as savings, accumulation of capital, technology, and foreign capital. Schumpeter (1911), a pioneer in the finance-economic growth theory explains that financial intermediaries and the services they provide are essential drivers for innovation and growth. Recent evidence shows that financial systems that are functioning well can lead to economic growth in the long run. It also illustrates that financial development enables the poor to become equal with the rest of the members of the economy as it grows.

The main reason why an efficient financial system is essential to an economy is that there are substantial information and transactions costs. Asymmetric information creates adverse selection and moral hazard, and high transactions costs impose inefficiencies. By specialising in collecting information, evaluating projects, sharing risks, and providing liquidity, an efficient financial system increases financial savings, and improves their allocations across investments. Consequently, financial intermediation

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increases capital productivity, and promotes economic growth (Garcia & Liu, 1999).

Garcia and Liu (1999) identified three main channels through which financial intermediaries and markets may affect economic growth. First, a developing financial sector makes room for increasing saving rates. By using economies of scale and expertise, financial intermediaries and markets are able to provide savers with a relatively higher yield, and therefore stimulate savings. A lot of literature has shown the role played by financial intermediaries and markets in increasing savings. For example, McKinnon and Shaw (1973) emphasise the role played by financial liberalisation in increasing savings and, hence, investment. They claim that financial deepening improves not only productivity of capital but also the saving rate and, therefore, investment and growth. Second, by reducing information and transactions costs, the financial intermediaries and markets perform the essential economic function of increasing the funneling of funds from lenders to borrowers.

Again, the financial sector improves the allocation of resources. A recent line of research argues forcefully that financial development enhances growth by promoting an efficient allocation of investment through various mechanisms: fund pooling, that is, making large investment projects possible and lending cheaper; risk diversification, that is, reducing productivity and default risks by holding diversified portfolios; liquidity management, that is, providing liquidity to investment projects; screening, that is, gathering and evaluating information on projects to channel funds to the most profitable ones; monitoring, that is, disciplining borrowers' performance to make sure they

fulfill their commitments. A well-functioning financial system improves resource allocation through these mechanisms (Garcia & Liu, 1999).

King and Levine (1993a) assert that financial services prompt economic growth through means such as boosting the rate of capital accumulation and improving the efficiency with which capital is used by economies. A well-implemented financial system through its functions for capital mobilisation, productivity improvements, liquidity provisions, price discovery and improved governance promotes economic growth. Levine (200) argues that well developed financial systems provide support for firms when faced with external financing constraints and this is one means through which financial development influences economic growth.

Financial Development and Poverty Reduction Nexus

Financial development also contributes to poverty reduction and helps in bridging the inequality gap. The augmented interest in the link between financial development and poverty reduction can be attributed to developing countries designing and implementing economic growth strategies that result in poverty reduction. Market failure and financial market imperfections are the main cause of poverty as they usually prevent poor people from borrowing against future earnings to invest, thus dealing with the causes of financial market failure could present better prospects for poor people (Stiglitz, 1994). Microfinance is key player in alleviating of poverty through the provision of loans and capital to the poor resulting in income generation which reduces the level of poverty. It removes the hurdle that prevents the less fortunate from exploiting investment opportunities as they arise.

Countries that have developed policies, regulatory framework and institutional infrastructures that can assist in amalgamating microfinance into the general policy and framework of their financial sector will benefit from this. Beck, Demirgüç-Kunt and Detragiache (1998) explained that financial development both decreases income inequality as the income of poor people grows at a faster rate and puts forth a disproportionately greater positive impact on the poor. This is due to the finance-economic growth nexus even when the growth rate of average per capita GDP is controlled. Child labour, often as a result of poverty is lower in countries where financial development is high as households depend less on child labour to handle the variations in income (Dehejia & Gatti, 2002). This means that if policies are designed in a way that increases the access of households to credit, the extent of child labour will decrease. This can only be done when the country is financially developed. An efficient financial sector enables households and individuals to access basic services such as health, education and water/sanitation, leading to a decrease in poverty levels. The proven importance and benefits of financial development has contributed to the development in a number of developing countries and implementing policies that promote financial sector development and ensuring that they function effectively are of great importance.

Skeptical Views on Financial Sector Development and Poverty Reduction

There are skeptical views on whether financial sector development can lead to a broadening of access to finance by the poor, especially at early stages. Some argue that it is primarily the rich and politically connected who would benefit from improvements in the financial system (Haber & Musacchio, 2004).

MFIs and SME credit programmes to ensure that a widest possible segment of population have access to finance. The most well-known example of MFIs is the Grameen Bank in Bangladesh founded by Muhammad Yunus who was awarded the 2006 Nobel Peace Prize for his contribution to microfinance. Supporting microfinance schemes and SME credit programmes has also been a key focus of development assistance (ADB, 2009).

Some of the conventional wisdom about the poverty reduction potential through allowing greater access to finance by microenterprises and SMEs has come under scrutiny recently. Some have questioned whether access to finance is the only constraint that microenterprises and SMEs face and hence a panacea for poverty reduction. Other constraints and challenges faced by these enterprises often highlighted in the literature include access to markets, access to know-how and technologies, and other market failures.

A United Nations (UN) report (1998) on the role of microcredit in the eradication of poverty cites findings of some studies that point to limits to the use of credit as an instrument for poverty eradication. This includes difficulties in identifying the poor and targeting credit to reach the poorest of the poor; the lack of business skills and even the motivation for the poor to undertake economic activity. Fragile or rudimentary administrative structures leading to high transaction costs of many MFIs; and the fact that in many cases, microcredit programmes have been stand-alone operations rather than accompanied by other support services, especially training, information, and access to land and technology were also included (ADB, 2009).

Also, ADB (2009) argues that access to finance is often only one of the major constraints to growth of these enterprises, and other constraints include

weak access to new technologies and to dynamic markets. Also, if SMEs were to increase productivity and employment, they must innovate, including adopting new technology and diversifying into new markets; and that governments should assist SMEs, and such assistance should include providing information services on technology and markets, vocational training, and technical support services, and fostering linkages between SMEs and large enterprises, in addition to facilitating access to finance, that is, following an integrated approach.

Thus, regardless of where one sees financial development, the most important point is that it improves efficiency by efficiently channeling resources to those who can most effectively use them. This means that financial development can reduce poverty and promote economic growth by functioning efficiently.

FINANCIAL DEVELOPMENT, ECONOMIC GROWTH, AND POVERTY REDUCTION NEXUS

The theory on financial sector development as emphasised today, in developing countries, goes back to Schumpeter (1934) when he stresses the role of banking sector as a financier of productive investments and in that way as an accelerator of economic growth. Modern growth theory however identifies two specific channels through which the financial sector might affect long-run growth: through its impact on capital accumulation (including human as well as physical capital) and through its impact on the rate of technological progress (Gregorio, 1996). These effects arise from the intermediation role provided by financial institutions which enable the financial sector to: mobilise savings for

investment; facilitate and encourage inflows of foreign capital (including FDI, portfolio investment and bonds, and remittances); and optimise the allocation of capital between competing uses, ensuring that capital goes to its most productive use (Bencivenga & Smith, 1991).

Patrick (1966) formulates a hypothesis on two possible causal relationships between financial development and economic growth. The first - called demand following approach where financial sector development arises as the economy develops. He views the demand for financial services as dependent upon the growth of real output and upon the commercialisation and modernization of agriculture and other subsistence sectors. According to Patrick (1966), the second causal relationship between financial development and economic growth is termed supply leading phenomenon where the widespread expansion of financial sector leads to economic growth. By implication, the establishment of financial institutions encourages the demand for financial services by the entrepreneurs in the modern, growth-inducing sectors.

On the other hand, the nexus between financial sector development and poverty reduction has been widely a subject of discussion in theoretical and empirical literature. It is widely believed that the poor in developing countries often do not have access to formal financial services, and are forced to rely instead on a narrow range of often expensive and more risky informal services. This hinders them from participating fully in markets and contributing to economic growth.

The channels (credit or money) through which poor people benefit from formal financial intermediation has been linked to the pioneer work of Keynes (1937) on the motive of finance for money demand. This was later revisited by

McKinnon and Shaw (1973) when he presented the —conduit effect. This comes with the assumption that the poor who self-finances investment offer profitable financial opportunities for savings in spite of the fact that financial institutions do not provide credit to them.

The duo of McKinnon and Shaw (1973) resuscitated the discussion on the influence of financial sector on the economy. Although their assumptions about the nature of money in the models differ, both theories have similar implications for financial sector development. Their financial liberalisation theory holds that financial repression (i.e. distortion of financial prices such as: interest rates reduces the real size of the financial system relative to non-financial , which leads to slow real rate of economic growth. Their basic proposition is that the relationship between interest rates and economic growth is positive and low interest rates tend to limit growth. At initial repressed stage, the nominal interest rate is administratively fixed and thus the real rate is kept below its equilibrium.

McKinnon and Shaw (1973) specifically argue that financial deepening increases the rate of domestic savings, and this lowers the cost of borrowing and thus stimulating investment. This argument is based on the fact that developing countries do experience financial repression. It asserts that the liberation of these countries from their repressive conditions would engender savings, investment and growth. This is in contrast to the neoclassical theory which posits that investment is positively related to the real rate of interest.

McKinnon and Shaw (1973) proposition is based on two premises. First, that all economic agents are independent and capable of self-financing and secondly that each undertaken investment has indivisibilities of considerable

value. The implications of these assumptions are that an investor must accumulate money balances before embarking on investment venture. This process of accumulation is enhanced if there is a positive real deposit interest rate. A positive real interest rate lowers the opportunity cost of accumulating balances and encourages individuals to deposit their money in banks. This makes loanable funds from which investors can borrow to accumulate. The indivisibilities of investment imply that the larger the demand for money, the greater the share of investment in total expenditures. Hence, money and capital are complementary in this theory. This is often described as the complementarity hypothesis. Without implying direction of causality, one can say that increased intermediation in this model leads to increased investment which is capable of bringing about increase in total output and causing economic growth.(Adebiyi, 2005).

McKinnon and Shaw (1973) model's submission is that money is backed by productive investment loans to the private sector. When the private sector credit is large relative to the level of economic activity (i.e. private sector credit per GDP), the level of intermediation between savers and investors is also larger. Thus, this theory explicitly emphasizes the importance of financial intermediation. Hence the reform of a repressed financial sector through the removal of interest rate ceilings and other form of controls engenders the higher real rates of deposit. This deepens financial intermediation process and leads to financial development by providing incentives to savers. Similar to McKinnon and Shaw (1973) position, endogenous growth theory which holds that the higher the saving rate, the higher the economic growth, to the extent that the financial sector development can affect saving rate by at least three ways

namely: lowering the cost of borrowing through providing risk diversification, accommodating liquidity preference and lowering liquidity constraints, lowering informational costs and increasing operational efficiency (Tsuru, 2000).

For their elaboration on the channels (credit or money) -the "conduit effect"- through which poor people benefit from formal financial intermediation, the McKinnon-Shaw hypothesis is, therefore, regarded as the foundation for poverty reduction through the instrumentality of financial sector deepening. The conclusions reached by McKinnon and Shaw (1973) were however faulted by Wijnbergen (1983) model. According to him, raising interest rate in the short run does not raise investment and production nor decrease inflation. Similarly, the framework developed by Giovannini (1983) raises doubt as to the positive interest elasticity of savings because interest rate elasticity is difficult to assess in developing countries. Models emanated from the later empirical works of Sikorsky (1996) and further challenge the validity of McKinnon and Shaw (1973) submission on the ground that it does not explain the workings of the banking systems in many developing countries and how liberalisation can address the questions of fragmentation, bank distress and financial rationing.

The DFID (2004) upholds that the provision of savings facilities enables the poor to accumulate funds in a secure place over time in order to finance a relatively large, anticipated future investment, and can sometimes provide a return on their savings. According to Jalilian and Kirkpatrick, and Parler (2007), the increased access to financial services by the poor will increase their income growth, thus having a direct impact on poverty reduction. The availability of

credit can strengthen the productive assets of the poor by enabling them to invest in productivity, enhancing new technologies such as new and better tools, equipment, fertilizers etc., or to invest in education and health which could provide for a higher income in future.

Deaton (1991) argues that access to credit and other financial services is likely to decrease the proportion of low-risk, low-return assets held by poor households for precautionary purposes (such as jewellery), and enable them to invest in potentially higher risk but higher return assets, (such as education, or a rickshaw), with overall long-term income enhancing impacts. Eswaran and Kotwal (1990) submit that just the knowledge that credit will be available to cushion consumption against income shocks if a potentially profitable but risky investment should turn out badly, can make the household more willing to adopt more risky technologies. The behaviour will increase the use of modern technologies with productivity-increasing, and hence income enhancing benefits. In the same vein, insurance can offer protection against certain types of shocks. These facilities can reduce the vulnerability of the poor and minimize the negative impacts that shocks can sometimes have on long-run income prospects (e.g. if income-generating assets are sold at low prices out of necessity during a household crisis). Thus the value of financial services in helping the poorest to cope with risks can be as or more important than the expected financial return (DFID, 2004).

Review of Empirical Literature

Financial Openness and Financial Development

Starting with cross-country regression studies, Huang (2005) studied the fundamental determinants of cross-country differences in financial development. Two prominent tools for addressing model uncertainty, Bayesian Model Averaging and General to-specific approaches were jointly applied to investigate the financial development effects of a wide range of variables taken from various sources. The analysis suggested that the level of financial development in a country is determined by its institutional quality, macroeconomic policies, and geographic characteristics, as well as the level of income and cultural characteristics.

Rajan and Zingales (2003) as well as Huang and Temple (2005) found the expected positive relationship between trade openness and financial development, at least in countries open to capital flows, which provides some support for the interest group theory of financial development. However, trade openness might affect financial development through channels other than easing the opposition of incumbent political and economic elites. For example, Do and Levchenko (2004) argue that in countries abundantly endowed with physical capital, specialization in capital-intensive industries increases the demand for well-functioning financial intermediation.

Also, regardless of the estimation method and at any conventional level of rejection, Herger, Hodler, and Lobsiger (2008) endeavoured to explain the vast differences in the size of capital markets across countries, by drawing together theories emphasizing cultural values, dysfunctional institutions, or impediments to trade as obstacles to financial development. To account for

endogeneity, instrumental variables pertaining to culture, geography, and colonial history were employed. They found that trade openness and institutions constraining the political elite from expropriating financiers exhibit a strong positive effect on the size of capital markets.

Conversely, cultural beliefs and the cost of enforcing financial contracts seem not to introduce significant obstacles for financial development. They found that trade openness tends to enlarge the size of capital markets for both equity and debt finance in a statistically significant manner. Furthermore, they explain that an increase in trade relative to Gross Domestic Product (GDP) of one standard deviation entails an increase in financial development of between one third and half a standard deviation. The positive entry of economic integration lends support to the interest group theory of Rajan and Zingales (2003), which claim that reducing impediments to trade increases the contestability of domestic markets, reduces monopoly rents, and thereby disciplines domestic elites not to corrupt the benefits of financial development away.

Baltagi, Demetriades and Law (2007), using panel data techniques and annual data, found that trade openness and financial openness together with economic institutions determines the financial development dissimilarity across countries. Their results showed that countries that are least open can benefit greatly in terms of financial development if they open either their trade or capital accounts. These countries can have even greater benefits if they open both, though opening only one can still result in banking sector development. On the other hand, countries that are most open benefit the least from added openness. Results from a study conducted by Kim, Lin and Suen (2010) consisting of 88

countries over the period 1960–2005 suggested that trade openness does play a critical role in determining the level of financial development. They found positive long-run and negative short-run effects of trade openness on financial development indicating that trade openness eventually contributes to financial development. However, when the countries are grouped in terms of income and inflation levels, their findings were consistent only in low-income or high inflation economies.

Druck, Plekhanov and Dehesa (2007) provided a cross-country empirical analysis of the determinants of financial deepening using a panel of 120 countries between 1997 and 2004 and found that higher credit-to-GDP ratios are associated with stronger creditor rights and lower inflation, and that the marginal effect of improvements in creditor rights protection is declining as the rate of inflation increases. Their analysis suggested that in a high inflation environment, controlling inflation and reducing macroeconomic volatility should be given a priority. Once these goals are achieved, the focus of attention should shift to creditor rights protection and credit information management to report that lower inflation increases the amount of credit in their sample.

Huybens and Smith (1999) showed that higher levels of inflation are associated with smaller, less active and less efficient stock markets. Levine (2005) using data for 16 emerging market countries found out that following capital controls liberalisation, stock markets in these countries have become larger, more liquid and more integrated following liberalisation.

Financial openness, another indicator positively linked to financial development is regarded as a key form of financial liberalisation in a number of recent studies. Using cross-sectional studies to examine a wide range of

countries over the period 1985-1995, Klein and Olivei (1999) determined whether opening capital accounts has an effect on financial development. With the ratio of liquid liabilities to GDP, the ratio of claims on nonfinancial private sector to GDP and the ratio of private bank to private plus central bank assets as the measures of financial development and capital account liberalisation as the measure of financial openness, they established a positive association between capital account liberalisation and financial development.

Ito (2005) using panel data for 108 countries over the period 1980 to 2000, investigated whether financial openness results in financial development when the level of legal development is controlled. They found that financial openness can only have a positive impact on equity markets if legal systems and institutions are at a certain threshold level and are well developed; otherwise capital accounts can negatively affect equity market development. They further showed that developing general legal systems and institutions in a country, not precisely linked to financial transactions is vital to benefit from open financial markets. Their study also revealed that to increase the benefits of financial openness in emerging countries, law and order should be quite high. Also, using a sample of 35 emerging countries during the period 1976 to 2003, Huang (2006) found that financial openness is a key determinant of the difference in financial systems development across countries and discovers a strong link to suggest that financial openness and development exists in stock markets. He further explained that stock market liberalisation is part of extensive macroeconomic reforms like inflation stabilization and trade liberalisation.

In considering the banking sector development in transition economies, Jaffee and Levonian (2001) focused on the changing intensity of three policies

that are commonly associated with financial repression, namely interest rate controls, statutory pre-emption and directed credit as well as the effects these policies had. The main findings of their studies were that the degree of financial repression has steadily increased between 1960 and 1980, and then declined somewhat before rising to a new peak at the end of the 1980s. Since the start of the overall economic reforms in 1991, the level of financial repression has steadily declined. Despite the high degree of financial repression, no statistically significant negative effects on savings, capital formation and financial development could be established which is contrary to the predictions of the financial liberalisation hypothesis. They further demonstrated that the level of GDP per capita and the saving rate have positive effects on the banking system structure as measured by bank assets, number, branches and employees for 23 transition economies.

Using pooled data from fifteen industrial and developing countries from 1980 to 1995, Garcia and Liu (1999) examined the macroeconomic determinants of stock market development, particularly market capiltalisation. Their paper found that real income, saving rate, financial intermediary development, and stock market liquidity are important determinants of stock market capiltalisation; macroeconomic volatility does not prove significant; and stock market development and financial intermediary development are complements instead of substitutes

Do and Levchenko (2004) pointed out that the extent a country's financial development is endogenous; it will in turn be influenced by trade. They build a model in which a country's financial development is an equilibrium outcome of the economy's productive structure: in countries with large

financially intensive sectors financial systems are more developed. When a wealthy and a poor country open to trade, the financially dependent sectors grow in the wealthy country and so does the financial system. By contrast, as the financially intensive sectors shrink in the poor country, demand for external finance decreases and the domestic financial system deteriorates. They tested their model using data on financial development for a sample of 77 countries. They found that the main predictions of the model are borne out in the data: trade openness is associated with faster financial development in wealthier countries, and with slower financial development in poorer ones.

Using an expanded set of legal indices, Pistor, Raiser and Gelfer (2000) provided evidence that legal institutions impact external finance more strongly than laws on the books even when legal change ensures shareholder and creditors' rights are improved. They found that the nonexistence of effective legal systems puts an important constraint on financial market development. Koubi (2008) also used a large cross section of countries to study whether political institutions pertaining to government quality matter for financial markets. He found that both the depth of financial markets and the stability of the rates of return on financial assets (stocks) are inversely related to the quality of government as measured by the quality of bureaucracy and infrastructure and governments respect for the rule of the law.

Billmeier and Massa (2007) using the Heritage Foundations' Index of Economic Freedom (2007) as a proxy for institutional quality has found that institutions have a positive and significant impact on stock market capiltalisation for a panel of 17 countries in the Middle East and Central Asia.

Krause and Rioja (2006) studied how financial development is related to short run stabilisation where monetary policy efficiency measures for 37 countries were derived. His results showed that developed financial markets, control for central bank independence, inflation targeting and adhesion to the European Monetary Union enhance monetary policy implementation. Also, Carranza et al. (2006) using data for 175 countries over the period 1980-2001 argued that countries with poorly developed financial markets, a monetary contraction policy will have a larger impact on credit than expansions.

With time series country specific studies, Nair (2008) examined the macroeconomic determinants of stock market development in India over 1993-994 to 2006-2007 empirically. He used cointegration and error correction modeling for the analysis. His results showed that there is long run relationship between all the macroeconomic variables used and stock market development. Variables like real income and its growth rate, interest rate and financial intermediary development significantly affect stock market development in the short run. He explained that financial intermediary development and stock market development are obtained to be complements in the Indian context. The variables exchange rate, inflation and foreign institutional investment have no significant influence on stock market development in India. These findings have important implications for the policy makers as stock markets are obtained to have a crucial role in promoting economic growth.

Also, in the Indian context, Darat and Mukherjee (1987) applied a vector auto regression model over 1948-1984 and found that a significant causal relationship exists between stock returns and selected macroeconomic variables. Bhattacharya and Mukherjee (2002) tested the causal relationships

between the BSE Sensex and five macroeconomic variables applying the techniques of unit-root tests, cointegration and long-run Granger non-causality test. Their major findings were that there are no causal linkage between the stock prices and money supply, national income and interest rate while the index of industrial production leads the stock price and there exists a two-way causation between stock price and rate of inflation.

Bittencourt (2011) examined the impact of inflation on financial development in Brazil from 1985 and 2002. His results which were based initially on time-series and then on panel time-series data analysis, were robust for different estimators and financial development measures, suggested that inflation presented deleterious effects on financial development at the time. He explained that the main implication of the results is that poor macroeconomic performance has detrimental effects to financial development, a variable that is important for affecting economic growth and income inequality. Therefore, low and stable inflation, and all that it encompasses, is a necessary first step to achieve a deeper and more active financial sector with all its attached benefits.

Wahid, Shahbaz and Azim (2011) examined the impact of inflation on financial development in case of Bangladesh for the period of 1985-2005. In doing so, ARDL bounds testing approach and Error Correction Model (ECM) were employed. Their results revealed that high trends of inflation impede the performance of financial markets. GDP per capita promotes development of financial sector through its causal channels. Also, Seetanah et al. (2009) investigated the relationship between inflation and banking sector development applying a time series analysis over the period 1968- 2006. Their results corroborated the threshold effect too for the case of Mauritius.

Seetanah, Padachi, Hosany and Seetanah,(2010) investigated the determinants of financial development using a time series analysis for the period 1970-2008 for Mauritius, by means of the ARDL approach and using two different proxies for financial development. Their results showed that trade openness and financial liberalisation are important determinants of financial development. In addition, investment rate, per capita income and literacy rates are also deemed to be important factors in stimulating financial development while inflation adversely influence financial development both in the short and long run. Their research findings were supplemented by a questionnaire survey and the results validated the above and further revealed that the level of institutional quality is very important as well. They also showed that cultural or religious forces play an insignificant role in determining financial development in a multi-cultural and relatively educated society like Mauritius.

Hauner (2008) examines the effect of credit to government on deepening, profitability and efficiency in banking sector. The study was done in country-level and cross-section regressions for 142 advanced and developing countries. In the study, it is shown that credit to government tends to be higher in countries that are poorer, with slower per capita growth and higher external debt. Hauner noted that credit to government has a negative effect on growth in developing countries, as there is a close relationship between credit to government and credit to private sector. Returning to banking sector, the analysis showed that share of lending to the government in total bank credit has a negative effect on bank deepening in developing countries but it does not have any effect in advanced countries. Regarding the profitability, the regressions indicated that in developing countries with credit to government profitability

his study was that there was a long-run cointegration relationship between financial sector development and poverty reduction.

Adam and Tweneboah (2008) used multivariate cointegration and error correction model to examine the impact of Foreign Direct Investment (FDI) on the stock market development in Ghana. Their results indicated that there exists a long-run relationship between FDI, nominal exchange rate and stock market development in Ghana. They found that a shock to FDI significantly influence the development of stock market in Ghana.

Last but not the least, Acheampong (2007) examined the McKinnon-Shaw thesis within the context of Ghana's financial sector episode. Specifically, he investigated the savings and real interest rate nexus, investment and real interest rate nexus, and investment and economic growth nexus using quarterly data from 1988 to 2004 and the VAR methodology. His result vindicated the savings and real interest rate nexus, investment and real interest rate nexus and investment and economic growth nexus when long run analysis is applied. However, the causality test validated the real interest rate and savings nexus, investment and financial development nexus and a reverse causality running from economic growth to savings. He concluded that the view of McKinnon-Shaw thesis that real interest rate liberalisation impacts positively on savings, investment and economic growth cannot totally be validated in the context of Ghana's financial liberalisation episode.

In fact, Acheampong (2007) relates to the current study in terms of the objectives and purpose, however, the channels through which financial openness or liberalisation impacts financial development are not totally the same. The current study extends the frontier to cover the effects of financial

openness or liberalisation on poverty. Again, both Acheampong (2007) and the current study involve time series analysis but methodologically, whiles Acheampong (2007) involved VAR and VECM, the current study involves ARDL or Bounds Test to Cointegration and the choice of any of the two modelling techniques is just a matter of the outcome of the order of integration.

Financial Development and Economic Growth

Starting with cross-country regression studies, Goldsmith (1969) using data on 35 countries over the period 1860 to 1963 on the value of financial intermediary assets as a share of economic output, showed graphically a positive correlation between financial development and the level of economic activity. However, given his unwillingness to draw any causal interpretations from his graphical illustrations, Goldsmith did not take a stand on whether financial deepening causes growth. This study could be criticised on the basis that it was limited to only 35 countries, did not control for intervening factors and used only one proxy for financial development which may not be an accurate measure (Levine, 2004).

King and Levine (1993b) built on Goldsmith's work by studying 77 countries over the period 1960-1989. They controlled for other factors affecting long-run growth, examined the capital accumulation and productivity growth channels, constructed additional measures of the level of financial development, and analysed whether the level of financial development predicts long-run economic growth, capital accumulation, and productivity growth. They used three proxies for economic growth. The ratio of bank credit to domestic credit, central bank domestic credit and the ratio of credit to private sector to GDP were used to proxy financial deepening. Running cross country regressions, they

showed that financial depth is a good predictor of growth, capital accumulation and economic efficiency over the next 30 years even after controlling for income, education, and measures of monetary, trade, and fiscal policy. This study did not however deal formally with the issue of causality and simultaneity bias.

Extending King and Levine (1993a) by accurately deflating nominal measures of financial intermediary and assets using consumer price index and incorporating legal origin indicators as instruments for the measures of financial deepening with different conditioning variables, Levine, Loayza, and Beck, (2000) examined 71 countries on panel data from 1960 to 1995. Using a panel GMM estimator to correct for country specific effects, their results indicate that the strong link between financial development and growth is not due to simultaneity bias but could be attributed to the effect of the exogenous component of financial intermediary development on growth. The argument is that since finance is based on contracts, legal origins (whether a country's Commercial/Company law derives from British, French, German, or Scandinavian law) that produce laws that protect the rights of external investors and enforce those rights effectively will do a better job at promoting financial development They concluded that financial deepening stimulates economic growth.

Beck, Levine and Loayza (2000) investigated not only the relationship between financial development and economic growth but also the relationship between financial development and the sources of growth in terms of private saving rates, physical capital accumulation, and total factor productivity. Using GMM and IV estimators to correct for possible simultaneity biases, they

concluded that higher levels of financial development lead to higher rates of economic growth and total factor productivity.

Bordo and Rousseau (2006) conducted a historical line of research using cross-country analysis with institutional variables. They used data for seventeen countries covering 1880 to 1997 in order to explore the link between finance, growth, legal origin and political environment. They found that political variables such as proportional representation election systems, universal female suffrage, frequent elections and infrequent revolutions or coups seem linked to larger financial sectors and higher conditional rates of economic growth. They, however, contend that most part of the growth-enhancing role of financial development remains unexplained by institutional fundamentals. The paper concluded that institutions are important for avoidance of financial crises, which can also affect economic growth.

Cross-country regressions, however, have been criticised for ignoring large differences between countries (Arestis & Demetriades, 1997; Neusser & Kugler, 1998). The reliability of their results has also been questioned due to the instability of long time series used (Quah, 1993). Some economists have expressed scepticism about the ability of cross-country regressions to explain the direction of causality. For example, Rousseau and Wachtel (2001) argue that often components, even pre-determined, measuring financial sector development remain correlated with the contemporaneous measures.

As a result a number of other studies have employed the panel methodology. The advantage with the panel methodology is that one has the ability to exploit the time-series and cross-sectional variation in the data, avoid biases associated with cross-country regressions and it permits the use of

instrumental variables for all regressors and thereby provides more precise estimates of the finance-growth relationship.

Allen and Ndikumana (2000) using four indicators of financial intermediation and three different panel techniques-simple OLS regressions, regressions including country-specific fixed effects, and regressions including a high-income dummy, they found a positive correlation between financial development and the growth of real per capita GDP for the Southern Africa Development Community (SADC).

Khan and Senhadji (2000) presented evidence on the finance-growth nexus for a 159 cross-section sample of countries using dataset covering 1960-1999. The study used four alternative proxies for financial deepening and controlled for investment as a share of GDP, the growth rate of population, the growth rate of terms of trade and the log of initial income. Estimating a growth equation using both a pure cross-country sample and five-year-average panels in order to overcome the defects in the cross-section methodology, they found positive effect of financial development on growth. Notable, however, was the fact that the authors found that the size of the effect varied with different indicators of financial development, estimation method, data frequency and the functional form of the relationship.

Lee and Chang (2009) applying recent advances in panel cointegration and panel error correction models for a set of 37 countries using annual data for the period 1970-2002, found evidence of a fairly strong long-run relationship among foreign direct investment, financial development, and economic growth. It was also found that the financial development indicators had a larger effect on economic growth than that of foreign direct investment. This confirms the

supply-leading hypothesis. Overall, the findings underscored the potential gains associated with foreign direct investment when coupled with financial development in an increasingly global economy.

Dabós and Gantman (2010) contribute to the literature on the finance-growth link by presenting new findings based on a new, larger dataset that improves over earlier studies in its greater coverage in terms of time periods and countries, as well as the incorporation of additional control variables like institutional quality and the size of the economy, countries' initial level of economic development, human capital and government spending. They used unbalanced panel dataset for 98 countries covering nine to five-year periods from 1961-1965 to 2001-2005 within the dynamic panels in a GMM framework. Their results demonstrated that financial development does not have a statistically significant effect on economic growth. They also showed that the orientation of a country's political and legal institutions, whether predominantly authoritarian or democratic, is not a relevant factor for economic growth. Most importantly, they found that the economy's size is a statistically significant determinant of growth. Their conclusion casts doubts on the strength of the growth-finance link.

Rioja and Valev (2004) reexamined the finance-growth nexus on a panel of 74 countries using GMM dynamic panel techniques. They found that in the low region with countries of very low levels of financial development, additional improvements in financial markets have an uncertain effect on growth. In the intermediate region, financial development had a large, positive effect on growth and in the high region, the effect was positive, but smaller.

This study established that the finance-growth link may vary according to the level of financial development.

Aziakpono (2003) examined for the Southern African Customs Union (SACU) and the Common Monetary Area, whether domestic financial intermediation matters for economic growth in an integrated financial market using highly sophisticated econometric techniques. Employing two indicators of financial intermediation and the panel methodology, the Zellner seemingly unrelated regression estimation method gave mixed evidence across the countries. He found strong support for the supply-leading hypothesis within the SACU, but a support for the demand-following hypothesis in the case of Botswana and Lesotho. The study concluded that for countries contemplating forming or entering an economic integration, in particular a monetary union, the development of their financial system along with addressing other institutional and structural problems in their economy would be a necessary precondition for them to derive maximum gains from such integration.

Ahlin and Pang (2008) focused on the interaction between corruption control and financial development in order to find out whether they work as complements or substitutes in promoting economic growth. They find out, using dynamic panel analysis on both macro and industry data during 1960-2000 that financial development and low corruption are substitutes. In other words, the growth impact of reducing corruption is higher when the financial system is less developed. Conversely, the growth impact of improving the financial system is higher when corruption is high. They, however, pointed out that there is overlap in the institutions and other ingredients behind financial development and corruption control.

Rousseau and Wachtel (2007) investigated what was happening to the impact of financial deepening on economic growth. Their study included panel data on financial and macroeconomic indicators for 84 countries from 1960 to 2003. They found out that first, excessive financial deepening or too rapid growth of credit may have led to both inflation and weakened banking systems which in turn gave rise to growth inhibiting financial crises across the countries. Secondly, they found that the increased incidence of financial crisis since the 1990s was primarily responsible for the weakening of the finance-growth link but found no direct evidence that liberalisation played an important supporting role.

Gregorio and Guidotti (1995) extending the sample of countries used by King and Levine (1993b) to 98, examined the empirical relationship between financial development and economic growth between 1960-1985 with the ratio of bank credit to the private sector to GDP as the only indicator of financial development. They employed both cross-section and panel methodology and found that by and large financial development leads to improved growth particularly. The authors, however, reiterate that the effects vary across countries, over time and levels of income. Furthermore, the study argued that the positive effect of financial intermediation on growth is due mainly to its impact on the efficiency rather than the volume of investment.

A substantial studies employed time-series on the finance-growth relationship using a variety of time-series techniques. These studies frequently used Granger-causality test and vector autoregressive (VAR) procedures. Others employed several measures of financial development and or more

powerful and sophisticated econometric techniques or examined individual countries in much greater depth.

In the case of Egypt, Abu-Bader and Abu-Qarn (2008) examined the causal relationship between financial development and economic growth in Egypt during the period 1960–2001 within a trivariate vector autoregressive (VAR) framework (investment being the additional variable). They employed four different proxies of financial development and apply Granger causality tests using the cointegration and vector error-correction (VECM) methodology. They found strong support for the view that financial development and economic growth are mutually causal, that is, causality is bi-directional. Furthermore, the results revealed that financial development causes economic growth through both increasing resources for investment and enhancing efficiency.

Examining the finance-growth nexus, Darrat (1999) employed multivariate Granger causality tests within a bivariate error correction model (VECM) for three Middle Eastern and North African (MENA) countries over the period 1964-1993. Using the currency and M2Y ratios as alternative measures of financial development, the study found support for the view that financial deepening is a necessary causal factor of economic growth although the strength and consistency of his evidence varied across countries and across the proxies used to measure financial deepening. He showed, however, that the causal relationships are predominately long-term in nature. A major policy implication is that, government policies aimed at promoting financial deepening in these countries must be persistent and sustainable in order to foster economic development.

Abu-Bader and Abu-Qarn (2008) extending and tremendously improving on the methodological shortfalls of earlier studies in MENA, examined the causal relationship between financial deepening and economic growth in five MENA countries using annual dataset between 1960 to 2004 within a trivariate vector autoregressive (VAR) framework. They employed four different measures of financial deepening with investment as a conditioning variable and real GDP per capita as indicator of growth. Applying Granger causality, cointegration and vector error correction methodology as well as variance decomposition, they found weak support for long-run relationship between financial deepening and economic growth and the supply-leading hypothesis. In cases where cointegration was detected, Granger causality was either bidirectional or it ran from growth to finance. They also demonstrated clearly that causality patterns vary across countries and financial measures.

Demetriades and Hussein (1996) carried out causality tests for 16 developing countries employing the ratio of bank deposit liabilities to nominal GDP and the ratio of bank claims on the private sector to nominal GDP as financial development indicators. In about half the countries examined, they found a feedback relationship between financial development and economic growth. In the other countries, the relationship run from growth to finance (unidirectional), suggesting that it is by no means universal that financial development leads economic growth.

Rousseau and Wachtel (1998) examined the nature of links between the intensity of financial intermediation and economic performance for five countries using time series over the 1870-1929 period. Cointegration test within

the vector error correction models (VECM) established long-run relationships among measures of financial intensity and real per capita levels of output. Granger causality tests then suggest a leading role for financial development in real sector activity, while feedback effects were largely insignificant. The results suggest an important role for intermediation in the rapid industrial transformations of all five countries.

Arestis, Demetriades and Luintel (2001) substantially augmented time-series studies on finance and growth by using measures of both stock market and bank development. They found additional support for the view that finance stimulates growth but raised some caution on the size of the relationship. Using quarterly data and applying time series methods to five developed economies, the study revealed that while both banking sector and stock market development explain subsequent growth, the effect of banking sector development is substantially larger than that of stock market development. The sample size, however, is very limited and it is not clear whether the use of quarterly data and a vector error correction model fully abstract from high frequency factors influencing the stock market, bank, and growth nexus to focus on long-run economic growth.

Antonios (2010) investigated the relationship between financial development and economic growth for 15 European Union member-states for the period 1965-2007 except for Greece (1978-2007), Portugal (1985-2007), Spain and Luxembourg (1975-2007). Estimating a simultaneous system equations model by the two-stage least squared method, he found that stock and credit market development in conjunction with the development of industrial production had a positive direct effect on economic growth for Austria,

Belgium, Ireland and Luxembourg, while the bank market development had a greater effect on economic growth for Sweden and UK. However, the stock market development had a greater effect on economic growth for Denmark, Finland, France, Germany, Greece, Netherlands, Italy, Portugal, and Spain. He concluded that there was a positive relationship between financial development and economic growth taking into account the negative effect of inflation and interest rates.

Arestis and Demetriades (1997) applied Johansen cointegration analysis within the VAR framework on quarterly time series from 1979 to 1991 for the US and Germany. They augmented the proxies for financial development by including indicators of stock market development and volatility. The study found two cointegrating vectors for each country and a unidirectional causality running from finance to growth. Stock market capitalisation was found to positively affect real GDP only through the banking system but stock market volatility had a clear negative effect on output in the case of Germany. In the US, however, the evidence suggests a reverse causality running from growth to banking system and capital market development. They concluded by showing that not only is it possible that the long-run causality may vary across countries but it is also possible, indeed likely, that the long-run relationships themselves exhibit substantial variation.

Agbetsiafia (2004) employed Johansen's approach to cointegration and the VECM based Granger causality to the finance-growth nexus to time series data covering 1963 to 2001 from 8 emerging countries in sub-Saharan Africa. Using five measures of financial development and real per GDP to proxy growth, he found long-run relationship between growth and financial

development. The results of causality test found mostly unidirectional causality running from financial development to economic growth in seven African countries thus lending support for the supply leading phenomena of the finance–growth nexus.

Ghirmay (2004) examined the finance-growth nexus using 13 sub-Saharan African countries with data covering 30 years. He used real GDP to proxy growth and credit to the private sector to real GDP as indicator of financial development. Employing cointegration and Granger causality techniques within a VAR framework, the results revealed that in almost all (11 out of 13) of the countries, financial development and economic growth were cointegrated over the sample period. Furthermore, the causality test yielded evidence of financial development causing economic growth in 8 countries, economic growth causing financial development (reverse causality) in 9 countries, and bidirectional causal relationships in six countries.

Neusser and Kugler (1998) carried out cointegration and causality tests for the 13 OECD countries between 1960 and 1994. They measured financial depth by the GDP of financial institutions, insurance companies, and pension funds. The empirical evidence indicated a weak causal link between financial development and economic growth especially for the smaller countries. Based on their results they concluded that it is not possible to make a general statement on whether financial development is truly an engine of growth or just a sign of the evolution of the whole economy due to independent factors.

Lu, Fausten, and Smyth, (2007) examined the impact of financial development on the Mauritian economic growth between 1970 and 2009. They used two measures of financial development namely M2 as a percentage of GDP

and claims of private sector in a multivariate VAR analysis. While the study found positive impact of financial development on growth, its effect is fairly minimal. The impulse response revealed that a shock in financial development had a positive response on growth. While they concluded that there is a need to invoke policies that increase the effectiveness of the financial sector.

Odhiambo (2007) studied the relationship between economic growth and financial development using time series data from 1980 to 2005 for three SSA countries. Using the ratios of currency to narrow money, bank claims on the private sector to GDP and broad money to GDP as indicators of financial development within a VAR/VECM framework, the study found conflicting results where the demand-following was supported in Kenya and South Africa while in Tanzania, the supply-leading response was found.

Odhiambo (2009) examined the impact of interest rate reforms on financial deepening and economic growth in Kenya employing annual series from 1968 to 2005. Employing the Johansen cointegration technique and Granger causality within an error-correction model, he found strong support for the McKinnon-Shaw hypothesis regarding the positive impact of interest rate liberalisation on financial deepening. The study also found support for the supply-leading hypothesis of the finance-led-growth argument. He concluded that the interest rate liberalisation in Kenya has succeeded in increasing economic growth through its influence on financial depth.

Odhiambo (2008) in an attempt to avoid problems inherent in bivariate VAR models, examined the dynamic causal relationship between financial depth and economic growth in Kenya using annual series from 1969 to 2005. He proxied financial deepening with M2 to GDP and economic growth by per

capita income within a trivariate VAR. Employing the cointegration and error-correction techniques, the empirical results of this study revealed that there is a distinct uni-directional causal flow from economic growth to financial development. The results also revealed that economic growth Granger causes savings, while savings drive the development of the financial sector in Kenya. The conclusion is that any argument that financial development unambiguously leads to economic growth should be treated with extreme caution.

Wadud (2005) investigated the causal relationship between financial development and economic growth for 3 South Asian countries namely India, Pakistan and Bangladesh using data from 1976 to 2008. He disaggregated the financial system into "capital market based" and "bank-based". Using the Johansen multivariate cointegration approach within the framework of vector autoregressive (VAR) model, the study found evidence for the finance-led-growth hypothesis.

Shan and Morris (2002) used the Granger causality technique to investigate the relationship between financial development and economic growth for nine OECD countries and China by estimating a vector autoregressive (VAR) model. The results of their study showed that five out of ten countries exhibited a bi-directional Granger causality; three of them exhibited reverse causality with economic growth leading to financial development while two countries do not have a causal effect at all.

Lu, Fausten and Smyth (2007) empirically researched the linkage between financial sector development and economic growth by assisting capital accumulation and enhancing the productivity in case of China. Employing Johansen cointegration and Granger-causality approaches within a vector

autoregressive (VAR) framework, they identified a bi-directional causality between financial development and capital accumulation but a weak link between financial development and productivity.

Dritsakis and Adamopoulos (2004) empirically investigated the causal relationship among financial development degree of openness of the economy and economic growth by using a Granger causality and cointegration approach in the case of Greece and found that there is one cointegrated vector among GDP, financial development and the degree of openness of the economy. A causal relationship between financial development and economic growth on one hand and also between the degree of openness of the economy and economic growth on the other hand were established.

Odedokun (1996) examining the finance-growth nexus for 71 developing countries with time series dataset that generally span the 1960s and 1980s period, employed the ordinary least square regression technique and concluded that financial intermediation promotes economic growth in roughly 85 percent of the countries and that the growth-promoting patterns of financial intermediation are practically invariant across various countries and regions.

Jung (1986) empirically examined the relationship between financial development and economic growth for 56 countries consisting of Less Developed Countries (LDCs) and industrialised countries covering 1950-1980 period. Whereas the ratio of money stock (M2) to GDP and currency were used as indicators of financial, economic growth was measured by development real per capita GDP. Employing Granger causality technique, the results revealed that whereas finance causes growth: more frequently in LDCs, growth causes finance more frequently in industrialised countries. The study concluded that

LDCs are characterised by the causal direction running from financial development to economic growth while the developed countries are characterised by the growth to financial development causality.

Al-Awad and Harb (2005) examined the linkages between financial development and economic growth in case of ten MENA countries for the period 1969-2000. Using both panel and individual country cointegration and Granger causality tests as well as variance decomposition within a quadvariate VAR framework, they found strong evidence of the existence of long-run relationship between financial deepening which is proxied by the ratio of private credit to monetary base and economic growth. They could not however clearly establish the direction of causality.

In a broad study of 41 countries over the 1960-1993 period, Xu (2000) used a VAR approach that permits the identification of the long-term cumulative effects of finance on growth by allowing for dynamic interactions among the explanatory variables. He found evidence for the proposition that financial development causes long-run economic growth.

Mohapi and Motelle (2006) provided an empirical examination of the finance-growth nexus with annual time series dataset for the case of Lesotho. Applying cointegration and Granger causality tests within the framework of bivariate VECM to five alternative proxies of financial intermediation on the one hand and real GDP growth, they failed to find any long-run relationship between financial deepening and economic growth. The results further revealed support for the non-causality hypothesis implying that there is no relationship between financial deepening and economic growth.

Luintel and Khan (1999) studied the long-run relationship between financial development and economic growth within a multivariate vector autoregressive (VAR) framework using annual dataset ranging from a minimum of 36 to a maximum of 41 years from10 countries. Whereas financial depth was measured as a ratio of total deposit liabilities of deposit banks to one period lagged nominal GDP growth, real interest rate and capital stock were proxied by real per capita output, discount rate and real per capita stock respectively. By conducting a quadvariate VAR, this study addresses the mis-specification problem inherent in the existing bivariate studies. Johansen cointegration framework through tests of over-identifying restrictions identified that in the long-run, financial depth is positively and significantly affected by the levels of per capita real income and the real interest rate. Causality tests carried out revealed a bi-directional causality between financial development and economic growth in all the sample countries.

Christopoulos and Tsionas (2004) observed that many time-series studies yielded unreliable results due to the short time span of data sets employed. In a quest to avoid this problem, they employed panel cointegration and causality analysis to examine the relationship between financial development and economic growth in ten developing countries. In contrast to Demetriades and Hussein (1996), Christopoulos and Tsionas (2004) found strong evidence in favour of the hypothesis that long-run causality runs from financial development to growth and that there is no evidence of bi-directional causality. Furthermore, they found a unique cointegrating vector between growth and financial development.

Vazakidis and Antonios (2009) empirically investigated the causal relationship between financial development and economic growth for Greece for the period 1978-2007 using Johansen co-integration Granger causality test within the Vector Error Correction Model (VECM). The study used the rate of change of real GDP as an indicator of growth, domestic bank credit to private sector as a percentage of GDP for credit market development, the general stock market index for the stock exchange market and the Industrial Production Index as proxy for the growth of industrial sector and its effect on economic growth. The results revealed that economic growth has a positive effect on stock market development and credit market development through industrial production growth in Greece.

Jean-Claude (2006) sought to explain the finance-growth nexus hypothesis using Granger causality tests in a Vector Error Correction Model (VECM) framework for China over the period 1980–2002. His empirical results support a complex set of bi-directional causality between the financial development proxies and economic growth variables. Additionally, bi-directional causality results revealed the Chinese financial system to be more driven by the real sector activities. He concluded that the development of financial institutions in China should not be emphasised unilaterally but rather, attention should be given to the complementary and coordinated development of financial reforms and changes in other areas.

Acaravci, Ozturk and Acaravci (2007) sought to analyse the effect of the financial intermediaries' development on economic growth using quarterly time series data from 1986-2006 for the case of Turkey. Employing Granger causality test within the VAR framework, they found evidence for a one-way

causal relationship running from financial development to economic growth in turkey.

Using data from 72 countries for the period 1978-2000, Demetriades and Law (2006) found that financial development had larger effects on growth when the financial system was embedded within a sound institutional framework. This was particularly true for poor countries, where more finance without sound institutions was likely to fail in delivering more growth. For these countries, they found that improvements in institutions were likely to deliver much larger direct effects on growth than financial development itself. They were also likely to have positive indirect effects through the financial system, particularly when the financial institutions were already providing large amounts of credit to the private sector.

Additional econometric sophistication has also been brought to bear on the finance and growth nexus. Jalil, Ma and Naveed (2008) sought to investigate the relationship between development of the financial sector and economic growth for South Africa using time series dataset from 1965 to 2007. Employing three indicators of financial development within the ARDL framework and the principal component analysis, the results indicate a positive relationship between financial development and economic growth for South Africa. Specifically, they found support for the finance-led argument.

Esso (2010) investigated the causal relationship between financial development and economic growth in the Economic Community of West African States (ECOWAS) countries over the period 1960-2005. The ARDL approach to cointegration and the test for non-causality proposed by Toda and Yamamoto were employed. Using the ratio of M2 to GDP as an indicator of

financial development, the results found a positive long-run relationship between financial development and economic growth in four countries-Cote d'Ivoire, Guinea, Niger and Togo and negative long-run relationship in Sierra Leone and Cape Verde. The results of the causality test showed that financial development causes economic growth only in Cote d'Ivoire and Guinea. The author concluded that the relationship between financial development and economic growth cannot be generalised across countries because these results are country specific.

Khan, Qayyum and Ghani (2006) empirically investigated the impact of trade and financial liberalisation on economic growth in Pakistan using annual observations over the period 1961-2005. They constructed the financial development index in a quest to circumvent the problem of multicollinearity in using several indicators of financial depth. Real GDP was employed as a proxy together with trade openness and real deposit rate as control variables. Estimating using the bound testing (ARDL) approach of cointegration, they found that both trade and financial policies play an important role in enhancing economic growth in Pakistan in the long-run. The feedback coefficient suggests a very slow rate of adjustment towards long-run equilibrium. This indicates that economic growth is a long-run phenomenon.

Ismail, Zaman, Atif, Jadoon and Seemab (2010) investigated the impact of financial development and trade openness on GDP growth in Pakistan using annual data over the period 1980-2009. Using the bound testing (ARDL) approach of cointegration advanced by Pesaran, Shin and Smith (2001) and Granger causality techniques, they found both long-run and short-run relationship among economic growth, trade openness and financial

development. The results further confirmed the validity of trade led growth and finance led growth hypotheses in Pakistan. This study is limited in the number of growth determining factors controlled for. By using only one measure of financial deepening and not conducting variance decomposition, it could not test the robustness of its findings.

Ang (2008) estimated a six-equation model of financial development and economic growth for Malaysia using time series covering the period 1960 to 2003 in order to examine the mechanisms linking these two variables. Employing the ARDL approach to cointegration, the results indicate that financial development leads to higher output growth via promoting both private saving and private investment. The findings also provide some support for the endogenous growth theory. However, other direct government interventions in the economy, such as resource allocation through the operation of a broad-based employee provident fund scheme and various public investment programmes seem to have impacted negatively on economic development in Malaysia.

Kargbo and Adamu (2010) examined the relationship between financial development and economic growth in Sierra Leone for the period 1970-2008. The method of principal components is employed to construct a financial sector development index used to proxy development in the sector. Employing the Autoregressive Distributed Lag (ARDL) approach, the study found a unique cointegrating relationship among real GDP, financial development, investment and real deposit rate. The results suggest that financial development exerts a positive and statistically significant effect on economic growth and investment is an important channel through which financial development feeds economic growth.

Wolde-Rufael (2009) re-examined the causal relationship between financial development and economic growth in Kenya for the period 1966–2005 within a quadvariate vector autoregressive (VAR) framework by including exports and imports as additional variables. They used four conventionally accepted proxies for financial development. Applying a modified version of the Granger causality test due to Toda and Yamamoto, the study found evidence for a bi-directional causality between financial development and growth in three out of the four measures of financial development. A major implication of the finding is that financial development promotes economic growth in Kenya and that policies at enhancing the development of the financial sector can help to spur economic growth.

Mohamed (2008) investigated the effect of financial development on economic performance in Sudan using time series between1970 and 2004. He modelled with M3 to GDP and credit to private sector to GDP as measures of financial development, growth rate of GDP for economic growth as well as control variables such as investment, government spending, inflation and trade openness. Using the ARDL approach to cointegration, the study found a weak relationship between financial development and economic growth in Sudan. These findings were attributed to the inefficient financial system, along with the absence of appropriate investment climate required to foster significant private investment and promote growth in the long-run.

Ege, Nazlioglu and Bayrakdaroglu (2008) examined whether financial development leads to economic growth in Turkey using quarterly time series from 1987 to 2007. They used five measures of financial indicators together with other control variables within the framework of the aggregate production

function. Employing the bounds testing (ARDL) approach to cointegration and Granger causality, they found long-run relationship between financial development and economic growth. Results of Granger causality revealed a strong unidirectional Granger causality from economic growth to financial development.

Muhammad and Umer (2010) examined the finance-growth nexus in the case of Pakistan. Employing the bound testing (ARDL) approach for cointegration and causality on annual dataset from 1973 to 2008, they found evidence for the demand-pulling hypothesis. The study showed a long-run association between broad money supply growth and economic growth but no evidence between domestic credit provided by banking sector and economic growth. They interpreted their findings as signifying a unidirectional causality running from real per capita income to financial development.

In the case of detailed country-case studies, Liang and Jian-Zhou, (2006) examined the relationship between finance and economic growth using annual series from 1990 to1999 in the case of 29 Chinese provinces. He proxied financial deepening by loans to GDP, bank competition and share of private credit and growth by the growth rate of real GDP per capita. Using the Generalised Method of Moments (GMM) approach, the study found that financial development significantly promoted economic growth in the coastal region but not in inland region.

Jayaratne and Strahan (1996) studied the impact of finance on economic growth by examining individual states of the United States. Interestingly, 35 states relaxed impediments on intrastate branching since the 1970s. They estimated the change in economic growth rates after branch reform relative to a

control group of states that did not reform. They sought to assess the impact of liberalising branching restrictions on state growth using a pooled time-series, cross-sectional. They found evidence showing that branch reform stimulated bank-lending quality and led to high real per capita growth rates.

Dehejia and Lleras-Muney (2003) extended these findings by also examining the impact of deposit insurance. By comparing states within the United States, the study eliminated the problems associated with country-specific factors. The study employed a natural identifying condition and the change in branching restrictions to trace through the impact of financial development on economic growth. It found evidence that branch reform boosted lending. This study showed that branch reform accelerated economic growth by improving the quality of bank loans and the efficiency of capital allocation. It also found that financial development boosts growth. The study concluded that it is the quality, not the quantity of lending that matters.

Studying the individual regions of Italy using dataset on households and financial services, Guiso, Sapienza, and Zingales (2002) examined the effects of differences in local financial development on economic activity across the regions of Italy. They established that local financial development enhances the probability that an individual starts a business, increases industrial competition and promotes the growth of firms. These results are weaker for large firms, which can more easily raise funds outside of the local area. This study was unique in that it succeeded in eliminating many of the weaknesses associated with examining growth across countries.

To this end, although there have been extensive empirical studies testing the views on the finance-growth nexus, empirical evidence in the case of Ghana

is scant and hard to come by. The study, however, present the few that were chanced upon.

Quartey and Prah (2008) sought to find out whether financial development in Ghana conforms to either the supply-leading, demand-following or Patrick's Stages of development hypotheses. They conducted Granger-causality test, impulse response function and variance decomposition analysis within a bivariate VAR framework. The results revealed evidence in support of demand-following hypothesis, when growth of broad money to GDP ratio is used as a measure of financial development. However, when growth in domestic credit to GDP ratio, private credit to GDP ratio, and private credit to domestic credit ratios are used as proxies for financial development, they found support for the 'independent' hypothesis. The problem with studies employing bivariate VAR is that they suffer from omitted variables problem and lead to erroneous causal inferences (Loizides & Vamvoukas, 2005).

Adam and Siaw (2010) examined whether financial sector development has caused economic growth and investment in Ghana using annual time series between 1970 and 2007.They employed credit to private sector to GDP, bank liquid reserve asset ratio and liquid liability ratio to GDP as proxies for financial development. Whereas GDP growth was used to measure economic growth, real domestic investment was used as control variable. Modelling these within the framework of a trivariate VAR and VECM, results of Johansen cointegration technique revealed a stable long-run relationship between growth rate and financial development. A similar result was found for the investment equation. However, with the exception of credit to private sector where causality runing from economic growth only, they found bi-directional causality between growth

and financial development. This study could be criticised in the basis that it could suffer from multicollinearity since it included three measures of financial development, which are bound to be highly correlated in a single equation. Hence, the possibility that the estimates may be invalid cannot be easily dismissed. Again, a major methodological flaw is its use of the pairwise Granger causality technique within a framework of cointegrated series. Darrat (1999) argues that the use of pairwise Granger causality technique within a model of cointegrated series produces large standard errors and result in erroneous inferences.

Financial Development and Poverty Reduction

To begin with, Naceur and Zhang (2016) provided evidence on the link between financial development and income distribution. Several dimensions of financial development were considered: financial access, efficiency, stability, and liberalisation. Each aspect was represented by two indicators: one related to financial institutions, and the other to financial markets. Using a sample of 143 countries from 1961 to 2011, the study finds that four of the five dimensions of financial development can significantly reduce income inequality and poverty, except financial liberalisation, which tends to exacerbate them. Also, banking sector development tends to provide a more significant impact on changing income distribution than stock market development. Together, these findings are consistent with the view that macroeconomic stability and reforms that strengthen creditor rights, contract enforcement, and financial institution regulation are needed to ensure that financial development and liberalisation fully support the reduction of poverty and income equality.

According to Chemli (2014), while the literature on the link between the financial development and the poverty has not been explored too much for the MENA region, there are no studies that examine this link using an autoregressive distributed lag approach (ARDL) and compare the results for the country. The objective of Chemli's paper is to fill this gap by examining the relationship between the financial development and the poverty for 8 countries in the MENA region over the period 1990-2012. The estimation results show the existence of an error correction mechanism that allows catching up to equilibrium at both specifications. Indeed, the results of the estimation of the long term equilibrium show that the ratio of domestic credit to the private sector as % of GDP is positive and significant for Algeria, Iran, Jordan and Tunisia while was a positive but non-significant sign for Egypt, Mauritania, Morocco and Yemen.

The first sample represents a number of countries in upper middle income, while the second is a number of countries in lower middle Income. For the second indicator of financial development, the results are positive and significant for the entire sample. The difference between these two indicators of financial development is explained by the effect of duct McKinnon. Besides we conclude that the growth rate of the GDP per capita and the rate of trade openness affect positively the household final consumption expenditure per capita (poverty) for the all samples. While the indicator for the Gini index affects negatively the indicator of poverty. It must be noted that financial development is conducive to poverty reduction. Thereby encourages financial development through improved access to financial services and credit to the poor.

Again, Zahonogo (2016) investigates the effects of financial development on poverty reduction using data from 42 sub-Saharan African countries for the period 1980-2012. Zahonogo employed System Generalised Method-of-Moment (GMM) to control for country specific effects and possible endogeneity. Zahonogo's empirical results revealed there is a financial development threshold below which financial development has detrimental effects on the poor and above which financial development could be linked with less poverty. The results point an inverted U curve type response. Zahonogo concluded that the relationship between financial development and poverty reduction is nonlinear for sub-Saharan African countries. By implication, the benefits of financial development to the poor are not automatic and therefore, appropriate governments' programmes and policies must be rolled out to compliment the outcomes of financial development.

To this end, Zahonogo's study is similar to the current study in terms of objectives, however, the departure lies in the fact that the current study involves time series analysis whereas Zahonogo's is a panel analysis. For this reason, the methods of analysis also differ for both studies. Whereas Zahonogo's research employed GMM in its estimation, the current study utilises ARDL in its investigation.

Further, Khan, Ahmad and Jan (2012), assert that poverty is one of the major macroeconomic problems of Pakistan. They therefore conducted a study with the objective of prescribing some policy measures to alleviate poverty in Pakistan. Time series data was used to examine causal relationship between financial deepening and poverty alleviation for the period 1981-2010. Khan et al, (2012) used broad money supply (M2/GDP), domestic credit to the private

sector (DCP/GDP) and domestic money bank assets (DMBA) as proxies for financial development and private per capita consumption as proxy for poverty reduction in their study. A newly developed autoregressive distributed lag-bounds testing procedure (ARDL) was used to examine the long-run relationship between financial development and poverty alleviation and concluded that financial deepening (broad money supply and domestic credit to private sector) have long-run relationship with per capita consumption (poverty alleviation).

On the other hand, domestic money bank assets have no long-run relationship with poverty alleviation. Results of Error Correction Mechanism (ECM) revealed the existence of both short-run and long run relation between private per capita consumption and ratio of broad money supply to GDP (M2/GDP). Domestic credit to private sector GDP (DCP/GDP) positively correlated with private per capita consumption. The study also established a positive relation of domestic money bank assets (DMBA) with per capita consumption. It concludes that financial deepening reduces poverty. Khan et al., (2012) recommended that microfinance has served as an important tool of poverty reduction. It should be intensified in rural areas. It is also essential to control the development of financial intermediaries as financial crises are especially detrimental to the poor sector.

However, Khan et al., (2012) study is similar to the current study in several ways. In terms of the objectives, nature of analysis, and estimation techniques, both studies set out to investigate the effects of financial development on poverty reduction, using ARDL estimation technique, and obviously in time series analysis. However, the difference is whereas the current

study involves index measures, and of course more indicators of financial development, the work of Khan et al. (2012) utilsed only three indicators of financial development. Again, the current study covers not only the effects of financial development on poverty reduction but also, the effects of financial development on economic growth and how financial openness imparts financial development.

Also, work done by Fowowe and Abidoye (2015) revealed that understanding the factors that are important in determining poverty and inequality is one of the steps in the fight to eradicate poverty in the world. This is particularly so for African countries because when compared to other regions, Africa has the largest concentration of people living below the poverty line. Babajide Fowowe and Babatunde Abidoye's study examined the effects of financial development as measured by private credit and broad money (M2) on poverty and inequality in African countries. Their empirical results conclude that financial development has not had a significant effect on poverty and inequality in African countries. Further, macroeconomic variables such as low inflation and trade openness were found to be statistically significant, implying that they can help reduce the level of poverty and inequality.

Last but not the least, Quartey (2008) primarily investigated the interrelationship between financial sector development and poverty reduction in Ghana. This was done using time-series data from the World Development Indicators from 1970-2001. The main findings of his studies were, first, that even though financial sector development does not Granger-cause savings mobilisation in Ghana, it induces poverty reduction; and second, that savings do Granger-cause poverty reduction in Ghana. Also, the effect of financial

sector development on poverty reduction is positive but insignificant. This is due to the fact that financial intermediaries in Ghana have not adequately channelled savings to the pro-poor sectors of the economy because of government deficit financing, high default rate, lack of collateral and lack of proper business proposals. Another interesting finding of his study was that there was a long-run cointegration relationship between financial sector development and poverty reduction. Albeit, Quartey (2008) and the current study have similar conclusions, they however differ in terms of the level of significance. This is because the long-run results of the current study between financial sector development and poverty reduction is also positive but statistically significant over the study period.

Chapter Summary

This chapter reviewed related literature on financial openness and the financial sector development. This revealed other important variables which together with financial openness spur growth in the financial sector. The variables include: trade openness, economic growth which proxied by real gross domestic product, real interest rate, and government expenditure. Again, the review was extended to cover financial development and economic growth nexus as well as financial development and poverty reduction nexus.

Further, it was also revealed that financial sector development plays a vital role in facilitating economic growth. A sound financial system supports growth through mobilizing and pooling savings; producing information ex ante about possible investments and allocating capital; monitoring investments and exerting corporate governance; facilitating the trading, diversification, and management of risks; and facilitating the exchange of goods and services. There

is also a consensus that financial sector development contributes to poverty reduction, and a major channel is through economic growth. Higher growth benefits the poor by creating more jobs, enabling the government to allocate more fiscal resources on social spending; and increasing funds available to the poor for investment.

On both the theoretical and empirical side, the literature revealed many channels through which financial development and poverty reduction are greatly influenced by institutional factors, macroeconomic factors, geographical factors, policies among others. Indeed, empirical studies on analyzing the determinants of financial developments for developing countries cases including Ghana using the Autoregressive Distributed Lag (ARDL) methodology have been very elusive.

CHAPTER FOUR

METHODOLOGY OF THE STUDY

Introduction

Following the review of related literature and the conclusions drawn, this current chapter presents the methodology employed in the study. It gives detailed description of the theoretical and empirical model specifications, definition and measurement of variables in the models, econometric or estimation techniques, sources of the data for the study, and the tools for data analysis.

Research Design

This refers to the overall strategy that a researcher uses to integrate the various components or aspects of the study in a coherent and logical way, thereby, ensuring that the researcher effectively addresses the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data.

Following the objectives of the study, the study adopted the positivist philosophy within the framework of neoclassical economics. The positivist believes that reality is stable and can be observed and described from an impartial viewpoint without interfering with the phenomena being studied (Levine, 1997). Thus, positivist philosophy enables the researcher to study social processes in an objective fashion and be able to explain relationships between variables. More importantly, the positivist philosophy predicts the use of quantitative approach to research as used in this study. Positivist philosophy is suitable for development of mathematical models to investigate the

relationship between quantitative measurements. Based on the positivist philosophy, this study employed the quantitative method.

The quantitative approach is appropriate for this study, because of the objectives of the study which is principally to investigate the effects of financial openness on financial development and how financial development affects economic growth and poverty reduction in Ghana. The quantitative approach enables the researcher to put the social world into a structure of causality and nullifies the role of human effect through the use of quantitative instrument such as multivariate statistical analysis in analyzing data as used in this study. More specifically, since the objectives of the study are explanatory in nature (that is to investigate the effects of financial openness on financial development and how financial development affects economic growth and poverty reduction), the study adopted the explanatory research design under the quantitative approach.

Philosophy of the Study

The goal of a research process is to extend the frontier of knowledge by finding things out in a systematic way. There are two broad research philosophies namely, positivist and interpretivist. The positivists argue that reality is stable and can be observed from an objective viewpoint, without interfering with the phenomenon under study. They expound further that a phenomenon should be isolated and that observations should be repeated. Predictions can be made on the basis of the previously observed and explained realities and their nexus or inter-relationships. The interpretivist approach, however, contends that only through the subjective interpretation of and intervention in reality can that reality be fully understood. They admit that there

may be many interpretations of reality, but maintain that these interpretations are in themselves part of knowledge.

Further, there have been different conceptions of the scientific method. In the 20th century, science was understood to be inductive. The inductive argument is from specific observations to broader generalizations and theories. It begins with specific observations, detects patterns and regularities, formulates some tentative hypotheses and finally develops some general conclusions or theories. Inductive reasoning, by its very nature, is generally more open-ended and exploratory.

Pearson, as cited in Weintraub (1999), explained the method of science as follows:

i. Careful and accurate classification of facts and observation of the correlation and sequence
ii. The discovery of scientific laws by aid of the creative imagination
iii. Self- criticism in the final touchstone of equal validity for all normally constituted minds.

On the contrary, Phillips and Pugh (2010) argued that the myth of the scientific method is that it is inductive. This is in favour of Popper (as cited in Philips and Pugh, 2010) whose argument was that the nature of the scientific method is hypothetic-deductive. The deductive argument works from the more general to the more specific. It might begin with thinking up a theory about a topic of interest, then narrowing it down into more specific hypotheses that can be tested. It is narrowed down even further when observations are collected to address the hypotheses. This ultimately leads to hypotheses testing with specific data, and validation or invalidation of the original theories.

The current study also hinges on the positivist paradigm that utilises systematic approach to research and as such lends itself to the use of quantitative methodology. The use of quantitative methodological approach usually, but not always, concentrates on the confirmatory stages of the research cycle that is the formulation of a hypothesis and the collection of numerical data to test the hypotheses. It is also a detailed documentation of plan for the collection, measurement and analysis of data (Kothari 2003).

This study further interprets the research process as hypothetico-deductive. Data enter the process when the hypotheses are put to test, and in the end, the predictions of the theories are verified. The process is driven by positivist conception of the scientific method, which rests on the formulation of theoretical hypotheses. The hypotheses are then subjected to empirical tests, in order to either accept or reject the theory.

Model Specifications

Theoretical Model for Financial Development and Financial Openness

Following Chin and Ito (2006); Huang (2005); Seetanah, Padachi and Hosany (2010), as well as Takyi and Obeng (2013), the economic model for financial development is specified as:

$$FSDI_t = f(FO_t, TOPN_t, RGDP_t, RIR_t, INF_t, GEXP_t)^{\lambda i} \quad (1)$$

Where $i = 1, 2, 3, , , , , , , , , , n$

This implies that:

$$FSDI_t = f(FO_t^{\lambda_1}, TOPN_t^{\lambda_2}, RGDP_t^{\lambda_3}, RIR_t^{\lambda_4}, INF_t^{\lambda_5}, GEXP_t^{\lambda_6}) \quad (2)$$

Where *FSDI* is financial sector development index, FO is financial openness, *TOPN* is trade openness, RGDP is real gross domestic product, RIR is the real interest rate, *INF* is inflation, and *GEXP* is government expenditure.

Empirical Model for Financial Development and Financial Openness

Consistent with the objectives of the study and in accordance with the literature, the study applied natural logarithm to equation (2) and estimated a log-linear model which becomes the econometric model of the following form:

$$InFSDI_t = \lambda_0 + \lambda_1 InFO_t + \lambda_2 InTOPN_t + \lambda_3 InRGDP_t + \lambda_4 RIR_t + \lambda_4 INF_t + \lambda_6 InGEXP_t + \gamma_t \quad (3)$$

Where $\lambda_1, \lambda_2, \lambda_3, \lambda_4 \lambda_5$, and λ_6 are the parameters of the respective variables, λ_0 is the constant term (drift), t denotes time and γ is a randomised error term with white noise and a normal distribution properties. The following a priori signs are expected:

$$\lambda_1 > 0, \lambda_2 > 0, \lambda_3 > 0, \lambda_4 < 0, \lambda_5 < 0, \lambda_6 > 0.$$

Basic Theoretical foundations of Financial Development and Economic Growth

The financial sector development affects the real sectors of the Ghanaian economy through the activities of the economic agents. In this regard, only the firms, and the households made up of individuals, representing private sector will be considered because of the tendency of crowding out private sector by government especially when government competes with the private sector for domestic credit, according to Mamoon (2004) and Acheampong (2007).

The Behaviour of a firm

The main activity of a firm is to produce consumption goods (both durable and non-durable) and pay rents for capital use. The firm does this through a modified aggregate production function. This production function is a modified Auerbach-Kotlikoff (AK) model defined by:

$$Y_t = F(K_t) = \Omega(A) K_t, \quad \Omega'(A) > 0 \qquad (4)$$

Where Y is output and K is a broad measure of capital stock. With our identification of K as a broad aggregate of different sorts of capital goods, suppose therefore that technological knowledge and physical capital are included in this aggregate. This change in the interpretation of K allows us to relax the crucial assumption of diminishing returns, and avoid a zero growth rate at the steady state or balanced growth path of the neoclassical growth model.

The parameter A indicates the level of financial development. Thus, by improving financial services provided to the real sectors of the economy, the microeconomic efficiency of financial development has positive effects on the whole of the Ghanaian economy. Financial sector efficiency is achieved through savings mobilisation, information acquisition about investments and resource allocation, monitoring managers and exerting corporate control, facilitating risk amelioration, and facilitating exchange. Thus, the economy with a more developed financial system will be able to transform a given amount of inputs, K, into a larger amount of output, Y, better than an economy with a less-developed financial system.

The study assumes that the representative firm behaves in a competitive manner and maximises the present value of all future cash flows. Hence, the firm's problem is:

$$Max \int_a^{\infty} [F(K_t) - I_t] e^{-\int_0^t r_t \, d_t} dt \tag{5}$$

$$s.t.\ K = I_t - \delta K_t \tag{6}$$

Where I_t denotes investment, r_t is the interest rate, δ represents the rate of capital depreciation.

Adopting the Optimal Control Theory and setting up the present value Hamiltonian of the problem results in:

$$H_1 = [F(K_t) - I_t] \, e^{\int_0^t r_v \, d_v} + \mu_t \, [I_t - \delta K_t] \tag{7}$$

The first order conditions for this maximisation problem are:

$$\frac{\partial H_1}{\partial I_t} = 0 \Rightarrow -e^{-\int r_v \, d_v} + \mu_t = 0 \tag{8}$$

$$\frac{\partial H_1}{\partial K_t} = \dot{\mu}_t \Rightarrow F_k \, e \int_0^t r_v \, d_v - \mu_t \, \delta = -\dot{\mu}_t \tag{9}$$

Using the first order conditions, the optimal behaviour of the representative firm is governed by the following relation:

$$r = \Omega(A) - \delta \tag{10}$$

Equation (10) implies that there is equalization of real interest rate to marginal product of capital, in this case financial development, after depreciation. That is, at the optimum, firms will be left with marginal product of capital minus the loss due to depreciation.

The Behaviour of the Household

Again, the study adopts representative infinite-lived individuals whose lifetime utility function is:

$$U_t = \int_0^{\infty} e^{-\rho t}\ u\ (c_t)\ dt \qquad (11)$$

Where c_t is the time path consumption per person, u (.) is an instantaneous utility function with $u'(c_t) > 0$, $u''(c_t) < 0$, and ρ is the personal discount rate. Moreover, individuals in this model do not work. They are assumed to hold b_t units of assets in the form of ownership claims on capital that pays real interest rate r_t. The representative individual is assumed to maximize utility subject to the budget constraint.

$$b_t = r_t\ b_t - c_t \qquad (12)$$

Again, based on the Optimal Control Theory, setting up the present value Hamiltonian gives:

$$H_2 = u\ (c_t)\ e^{-\rho t} + \lambda_t\ [r_t\ b_t - c_t] \qquad (13)$$

Where λ_t is the present-value shadow price of financial income.

The first order conditions for maximizing the Hamiltonian are:

$$\frac{\partial H_2}{\partial c_t} = 0 \Rightarrow u'(c_t)\ e^{-\rho t} = -\lambda_t \qquad (14)$$

$$\frac{\partial H_2}{\partial b_t} = -\dot{\lambda}_t \Rightarrow -\lambda_t r_t = \dot{\lambda}_t \tag{15}$$

$$\lim_{t \to \infty} (\lambda_t, b_t) = 0 \text{ transversality condition} \tag{16}$$

We characterise the optimal growth path by an instantaneous utility function that belongs to the isoelastic class, defined by the condition:

$$u'(c_t) = c_t^{-\sigma}, \sigma > 0 \tag{17}$$

Where the parameter, σ, is the inverse of the intertemporal elasticity of substitution or the relative risk aversion coefficient.

Deducing from the first order conditions, the well-known Euler equation:

$$\frac{1}{c_t}\frac{dc_t}{dt} = \frac{r - \rho}{\sigma} \tag{18}$$

Equation (18) shows that the rate of growth of consumption is a function of the difference between the real interest rate, r and discount rate ρ. This implies that per capita consumption will be on the increase if the real return exceeds the rate at which households discount future consumption, and will be decreasing if the reverse is the case. However, these changes in consumption in response to differences between the real interest rate and the discount rate depend on the size of the marginal utility, σ. A small σ or lower marginal utility implies a large change in consumption as a result of the differences between the real returns and the discount rate.

The question that arises from equation (20) is how much of the increase in output can be attributed exclusively to changes in physical and human capital?

This is because it is possible for other factors, other than labour and capital to influence output. To resolve this problem, Rebelo (1991), disintegrates increase in output into three components: physical capital accumulation, human capital and growth of total factor productivity (TFP). The growth of TFP captures the increase in output that is not accounted for by an increase in capital stock (physical and human) in the model. Thus, the TFP may be interpreted as the effect of endogenous technological progress that can also be reflected in increasing productive efficiency. To account for this, Endogenous growth theorists employed the Cobb-Douglas production function expressed as:

$$Y_t = f\ (A_t\ K_t\ \ell) \qquad (21)$$

Where Y is output or real GDP at time t, A is total factor productivity, K is capital stock (physical and human capital) and ℓ represents the naperian "e". Applying the Cobb-Douglas production function, Endogenous growth theorists stated the equation:

$$Y_t = AK_t^{\beta_1} \ell^{\varepsilon_1} \qquad (22)$$

It is important to note that A is not fixed, but varies with different production functions based on the factors being studied.

Empirical Model for Financial Development and Economic Growth

The Cobb-Douglas production function described above is used as the basis for specifying the empirical model for this study. This is augmented with

Where the coefficients: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$, and β_9 are the parameters of the respective variables, β_0 is the intercept or constant term (drift), t denotes times and ε is the error term. The following a priori signs are expected:

$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 < 0, \beta_6 > 0, \beta_7 < 0, \beta_8 > 0$, and $\beta_9 > 0$

To this end, given the nature of the objectives of the study (i.e. to investigate the effects of financial development on economic growth in Ghana), it becomes imperative to express equation (27) in a growth form. The growth rate of a variable is the difference between the variable's current and previous values, divided by the previous value.

From equation (8), the growth form is shown below:

$$\frac{\ln RGDP_t - \ln RGDP_{t-1}}{\ln RGDP_{t-1}} = \beta_0 + \beta_1\left[\frac{\ln BSDI_t - \ln BSDI}{\ln BSDI_{t-1}}\right] + \beta_2\left[\frac{\ln SMDI_t - \ln SMDI_{t-1}}{\ln SMDI_{t-1}}\right] + \beta_3\left[\frac{BMDI_t - BMDI_{t-1}}{BMDI_{t-1}}\right] + \beta_4\left[\frac{\ln GEXP_t - \ln GEXP_{t-1}}{\ln GEXP_{t-1}}\right]$$

$$+\beta_5\left[\frac{RIR_t - RIR_{t-1}}{RIR_{t-1}}\right] + \beta_6\left[\frac{InGFCF_t - InGFCF_{t-1}}{InGFCF_{t-1}}\right] + \beta_7\left[\frac{INF_t - INF_{t-1}}{INF_{t-1}}\right] + \beta_8\left[\frac{TOPN_t - TOPN_{t-1}}{TOPN_{t-1}}\right] + \beta_9\left[\frac{InFDI_t - InFDI_{t-1}}{InFDI_{t-1}}\right] + \varepsilon_t \quad (28)$$

According to Growth Accounting theory, the equation (28) now becomes:

$$\ln RGDP_t - \ln RGDP_{t-1}$$

$$= \beta_0 + \beta_1(\ln BSDI_t - \ln BSDI_{t-1}) + +\beta_2(\ln SMDI_t - \ln SMDI_{t-1}) + \beta_3(\ln BMDI_t - \ln BMDI_{t-1}) + \beta_4(\ln GEXP_t - \ln GEXP_{t-1}) + \beta_5(\mathrm{RIR}_t - RIR_{t-1}) + \beta_6(\ln GFCF_t - \ln GFCF_{t-1}) + \beta_7(\mathrm{INF}_t - \mathrm{INF}_{t-1}) + \beta_8(\ln \mathrm{TOPN}_t - \ln TOPN_{t-1}) + \beta_9(\ln \mathrm{TOPN}_t - \ln TOPN_{t-1}) + \varepsilon_t \quad (29)$$

$$\Delta \ln RGDP_t = \beta_0 + \beta_1 \Delta \ln BSDI_t + \beta_2 \Delta \ln SMDI_t + \beta_3 \Delta \ln BMDI_t + \beta_4 \Delta \ln GEXP_t + \beta_5 \Delta RIR_t + \beta_6 \Delta GFCF_t + \beta_7 \Delta INF_t + \beta_8 \Delta \ln TOPN_t + \beta_9 \Delta \ln FDI_t + \varepsilon_t \quad (30)$$

The long run growth model to be estimated in this study is:

$$\ln RGDP_t = \beta_0 + \beta_1 \ln BSDI_t + \beta_2 \ln SMDI_t + \beta_3 \ln BMDI_t + \beta_4 \ln GEXP_t + \beta_5 RIR_t + \beta_6 GFCF_t + \beta_7 INF_t + \beta_8 \ln TOPN_t + \beta_9 \ln FDI_t + \varepsilon_t \quad (31)$$

The short run model to be estimated for this study is given as:

$$\Delta \ln RGDP_t = \sum_{i=1}^{h} \theta \Delta \ln RGDP_{t-i} + \sum_{i=1}^{g} \beta_1 \Delta \ln BSDI_{t-i} + \sum_{i=1}^{g} \beta_2 \Delta \ln SMDI_{t-i} \sum_{i=1}^{g} \beta_3 \Delta \ln BMDI_{t-i} + \sum_{i=1}^{p} \beta_4 \Delta \ln GEXP_{t-i} + \sum_{i=1}^{k} \beta_5 \Delta RIR_{t-i} + \sum_{t-i}^{z} \Delta \beta_6 \ln GFCF_{t-i} + \sum_{i=1}^{w} \beta_7 \Delta INF_{t-i} + \sum_{i=1}^{q} \beta_8 \Delta \ln TOPN_{t-i} + \sum_{i=1}^{m} \beta_9 \Delta \ln FDI_{t-i} + \rho ECT_{t-1} + \varepsilon_t \quad (32)$$

Where $RGDP_t$ refers to real gross domestic product growth ($RGDP_t$), $BSDI_t$ is banking sector development index, $SMDI_t$ is stock market development index , $BMDI_t$ is bond market development index, $GEXP_t$ is aggregate final expenditure,FDI_t is foreign direct investment, RIR_t is real interest rate, $GFCF_t$

is gross fixed capital formation (formerly known as aggregate investment), INF is inflation, $TOPN_t$ is trade openness, FDI_t is foreign direct investment, 'ln' is natural logarithm operator, Δ is the difference operator, and ECT_{t-1} is the error correction term lagged one period. β_i, represents the elasticity coefficients of the respective variables, where $i = 1, \ldots, 9$,with ρ showing the speed of adjustment. β_0 is the drift component, t denotes time and finally ε is the stochastic error term.

Theoretical Model Specification for Financial Development and Poverty Reduction

Poverty reduction represents a major challenge for all countries and specifically for developing ones. The international Organisations such as World Bank and the International Monetary Fund have incorporated the objective of poverty reduction in most of their development programmes. Therefore, and to fight against this menace, priority was given to pro-growth policies because it has been shown that countries which experienced high rates of economic growth are those that are managed to reduce their poverty rates. Since the seminal work of McKinnon and Shaw (1973), economists generally consent that financial development enhances economic growth

Theoretically, financial development may affects poverty through two channels. The first channel shows that financial development affects poverty directly by improving the access of the poor to financial services (Odhiambo, 2009; Pradhan, 2010). The second channel indicates that financial development affects poverty indirectly by stimulating economic growth through increased investment rates (King & Levine, 1993; Levine, 2005) Some studies argue that

financial development has a strong positive impact on the income of the poor and contribute to poverty reduction (Boukhatem & Mokrani, 2012; Honohan, 2004; Jalilian & Kirkpatrick, 2002; Odhiambo, 2009) while others find that financial development does not affect the poor and opined that there is a negative relationship between financial development and (Dollar & Kraay, 2002; Fowowe & Abidoye, 2012). Clarke, Zou, and Xu, (2003) income inequality rather than an inverted-U shaped relationship suggested by Greenwood and Jovanovick (1990).

Further, the lack of clear relationship between financial development and poverty could be because financial development almost certainly requires combination with other appropriate policies that encourage access to financial services and investment for the poor, allow effective conflict resolution and promote human-capital accumulation. So, institutions can help explain the heterogeneity in financial development-poverty relationship. On policy perspective, since financial sector reform is frequently addressed in policy prescription packages by World Bank and International Monetary Fund to enable the poor accessing financial services, it is important to know how and through which mechanisms financial development affects poverty alleviation. The main policy conclusion is that a poverty reduction strategy should not be based solely on financial development, but also on good macroeconomic policies and efficient institutions, which seem to be more robust in poverty regression.

The link between financial sector development and poverty reduction can be either direct or indirect. To this end, the study proposes a poverty growth model that captures the dynamic behavior of poverty on the level of financial

Following the economic growth strategy of the analytical framework underpinning poverty reduction which holds that economic growth is a necessary but not a sufficient condition for poverty reduction, Nemedia (2001), Obadan (2001) and DFID (2004). Thus, equation (34) above is modified as follows:

$$POV_t = f(RGDP_t, O, \varepsilon) \quad (35)$$

Where O represents other variables required to complement economic growth in modeling poverty.

As regards other independent variables aside economic growth, this thesis or study considers financial sector development as primary variable of interest. To measure financial development, a data that captures the development of the formal and informal financial system would have been appropriate for measuring the impact on poverty. Many indicators have been employed in studies examining the impact of finance on poverty reduction. The commonly used indicators of financial development which are available for most developing countries, including Ghana over a long period of time are the ratio to GDP of the liquid assets of the financial system, or M2 (currency plus demand and interest-bearing liabilities of banks and non-banks), and the ratio to GDP of the value of credits granted by financial intermediaries to private sectors. These two indicators are used by Levine, Loayza, & Beck (2000) in their analysis of the relationship between financial intermediation and growth.

According to Kpodar and Jeanneney (2008), these two indicators have different meanings. The first is related to the ability of financial systems to provide transactions services and saving opportunities and it is therefore relevant for testing the McKinnon Conduit Effect, while the second, by

in the literature on the negative effects of inflation on poverty. Easterly and Fischer (2001) use data from an international poll of 31,869 respondents in 38 countries to find that inflation tends to lower both the share of the bottom quintile of the income distribution and the real minimum wage; it also tends to increase poverty. Following Easterly and Fischer (2001) inflation rate is introduced into the model.

Athukorala and Sen (2004) uphold that the behaviour of the savings ratio, s is also influenced by trade openness (TOPN) which in this study, is measured by composite trade index. Hence, the behavior of savings rate, s is partly expressed as follows:

$$s = f(INF_t, TOPN_t) \tag{40}$$

Substituting the function in equation (40) into equation (36) leads to the following:

$$POV_t = f(FSDI_t, RGDP_t, INF_t, TOPN_t, GEXP_t, GFCF_t, \varepsilon) \tag{41}$$

Where POV_t is an indicator of poverty level measured by household final consumption expenditure per capita and is derived by dividing the total household final consumption expenditure by the total population, $FSDI_t$ is the financial sector development index which is a measure of overall financial sector development involving nine indicators of financial sector development.

$RGDP_t$ is the real gross domestic product. When real gross domestic product is divided by total population, the outcome is real income per head with reference to 1990 constant price; INF_t denotes inflation rate; $TOPN_t$ denotes the level of trade openness, $GEXP_t$ is government final consumption expenditure which represents the role of government in improving the lives of the poor, and $GFCF_t$

is the gross fixed capital formation which captures the role of capital in the growth process.

It is expected a priori that, economic growth (RGDP), financial sector development (FSDI), trade openness (TOPN), government final consumption expenditure(GEXP), and gross fixed capital formation (GFCF) to benefit the poor by giving them better access to goods and services and enhancing their well-being. Expectedly, the relationship between these explanatory variables and poverty is negative, while inflation is detrimental to the well-being of the poor, thus, the expected a priori is positive.

The Financial Development and Poverty Reduction Nexus

According to Levine and Roberts (2008), lack of access to financial services is one of the main factors explaining persistent poverty. The role of financial development has been debated extensively in poverty reduction strategy. Theory suggests that access to finance allows the poor to better investment and education (Beegle, Dehejia, & Gatti, 2003; Jacoby & Skoufias, 1997). Financial development is recognised as a mean that can lead to the reduction of poverty by helping poor to diversify their sources of income through self-employment. The development of financial sector can ease the credit constraint hitherto faced by poor households and which limited their abilities to undertake productive investment. Theoretically, financial development can directly contribute to poverty reduction by improving the opportunities for the poor to access formal finance and enables them to achieve a sustainable livelihood (Jalilian & Kirkpatrick, 2002; Stiglitz, 1998) Financial development can also indirectly reduce poverty and income inequality through

enhancing economic growth and the gains from growth are channelled to the poor. One of the ways in which financial development enhances economic growth is through the mobilisation of funds from inefficient to efficient use.

However, theory provides conflicting predictions about the effects of financial development on the income of the poor. Huang and Singh, (2011) argue that if financial markets were perfect, the availability of finance would allow individuals to fund education, training or business opportunities. In this regard, financial development would contribute to equalize opportunities by reducing the importance of initial wealth and then would favor the poor. But other theories suggest that financial deepening would favor the rich because financial institutions operate in settings where complete information is often unavailable. In this context, projects from entrepreneurs that have different probabilities of success are indistinguishable and the information asymmetry requires banks to screen application so as to grant loans only to the most promising projects (Singh, 1992).

Consistent with theoretical analyses, empirical investigations are controversial. The evidence pointed that the degree of financial intermediation has a strong and positive impact on the income of the poor (Beck, Demirgüç-Kunt, & Levine, 2009; Boukhatem & Mokrani, 2012; Jalilian & Kirkpatrick, 2002) Financial development can improve the opportunities for the poor to access formal finance by addressing the causes of financial market failures such as information asymmetry (Stiglitz, 1998).

Again, financial development can enable the poor to start microenterprises, which generate more employment and higher income and thereby reduce poverty. This is made possible as the poor will have better and

depends on financial development, and a set of control variables. The model specification is as follows:

$$POV_t = f\ (FSDI_t, RGDP_t, INF_t, TOPN_t, GEXP_t GFCF_t)^{\sigma i} \quad (42)$$

Where $i = 1,2,3,,,,,,,,,,,,,n$

This implies that:

$$POV_t = (FSDI_t^{\sigma 1}, RGDP_t^{\sigma 2}, INF_t^{\sigma 3}, TOPN_t^{\sigma 4}, GEXP_t^{\sigma 5}, GFCF_t^{\sigma 6}) \quad (43)$$

Where POV_t is the level of poverty at time t and , $FSDI_t$ $,RGDP_t, INF_t, TOPN_t, GEXP_t, GFCF_t$ are as defined previously

Empirical Model for Financial Development and Poverty

Again, consistent with the objectives of the study and in accordance with the literature, the study applied natural logarithm to equation (43) and estimated a log-linear model which becomes the econometric model of the following form:

$$InPOV_t = \sigma_0 + \sigma_1 InFSDI_t + \sigma_2 In\ RGDP_t + \sigma_3\ INF_t + \sigma_4 In\ TOPN_t$$

$$+\ \sigma_5 In\ GEXP_t + \sigma_6 In\ GFCF_t + \mu_t \quad (44)$$

Where $\sigma_1, \sigma_2, \sigma_3, \sigma_4, \sigma_5,$ and σ_6 are the elasticity of coefficients or parameters of the respective variables, σ_0 is the constant term (drift), t denotes time and μ_t is a randomised error term with white noise and a normal distribution properties. However, the following a priori signs are expected:

$$\sigma_1 < 0, \sigma_2 < 0, \sigma_3 > 0, \sigma_4 < 0, \sigma_5 < 0, \sigma_6 < 0$$

Definition, Measurement of Variables and Sign Expectations

For the purpose of this study, the following measurements and operational definitions were used for the variables being examined. The variables included in the study are: real GDP (Economic Growth), financial development, government expenditure, real interest rate, gross fixed capital formation (capital), inflation, trade openness, foreign direct investment, financial openness, and household final consumption expenditure per capita, also known as private per capita consumption (poverty). The choice of the variables was informed by the extant literature on the topic, economic theory, data availability and their significance to the study. The basis for the signs of the respective coefficient of the variables is explained in the description of the variables below.

Economic Growth

Economic Growth is defined as the sustained increase in a country's real output or real gross domestic product overtime (Demetriades & Hussein, 1996). In this study, real GDP will be used as a proxy for economic growth instead of GDP growth rate or GDP per capita since it is the most popular measure of economic growth in the literature and mostly used too by the Breton Wood Institutions. Besides, this measure is preferred to other measures because, it nets out the effect of inflation on the price of the goods and service produced by adjusting inflation terms. Economic growth is used as the dependent variable in the model. Thus, real GDP is used as a proxy for Economic growth. Ayadi and Ayadi (2008) employed real gross domestic product as a proxy for economic

growth in examining the impact of external debt, and trade openness on economic growth for Nigeria and South Africa.

Financial Development

Financial development generally means increasing the efficiency of allocating financial resources and monitoring capital projects, through encouraging competition and increasing the importance of the financial system.

Ideally, to measure financial development, one should quantify how well financial systems accomplish their functions, that is, the mobilisation of savings, the easing of exchange of goods and services, the ex-ante production of information about investments and the allocation of capital, the ex post monitoring and the exertion of control of realised investments, the facilitation of trading, and the diversification and management of risk (Levine, 1997). However, majority of these functions are qualitative in nature. In addition, financial systems may accomplish their functions equally efficiently under different structures. To overcome this objective difficulty, several indicators have been used in the literature to measure financial development.

King and Levine (1993) used liquid liabilities to GDP as a measure of the size of financial intermediaries, credit to private enterprises to GDP as an activity measure, and the ratio of bank assets to the sum of bank assets plus central bank assets. Rousseau and Wachtel (1998) used measures that include the assets of both banks and non-banks, such as private credit to GDP from banks and non-deposit money banks. Levine and Zervos (1998) added measures of stock market size and liquidity to bank development measures. Last but not

the least, Pesaran, Shin, & Smith (2001) included measures of life insurance and private pension fund assets to measure financial development.

However, in order to achieve the objectives this study sets for itself, financial development is disaggregated into banking sector development, stock market development and bond market development and an index is constructed for each aggregate using principal component analysis(PCA) approach.

Hence, financial sector development in this study is proxied by banking sector development index (BSDI), stock market development index (SMDI), bond market development index (BMDI), and financial sector development index (FSDI)

Principal Component Analysis (PCA)

Principal Components Analysis (PCA) in its simplest form involves a mathematical procedure that helps to transform a number of possibly correlated variables into a smaller number of uncorrelated ones which we call principal components. This type of analysis has two main objectives: reducing the dimensionality of the data set, and identifying new meaningful variables.

Principal component analysis here aids in determining the weights of the variables to be included in an index arbitrarily by constructing in such a way that the resulting components account for a maximal amount of variance in the data set. This method has been shown to be more efficient in establishing the optimal weights of variables in comparison to other type of methods (equally weighted index and coefficient of variation type index) where variables are given equal or subjective weights which may bias the outcome of the study.

The eigenvalues are calculated for each component. The size of an eigenvalue indicates the amount of variance in the principal component explained by each component. The first principal component reflects the largest proportion of the total variability in the set of indicators used. The second component accounts for the next largest amount of variability not accounted for by the first component and so on.

It is however, imperative at this point, to indicate that in constructing indices for a variable which can be measured by various set of indicators as is the case for financial development, the researcher is required to conduct Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test whose test value should be at least 0.5 on a scale of one, indicating that there is enough evidence for the construction of an index for the indicators or variables under consideration.

To this end, the variables included in constructing the indexes for financial development are: private sector credit as a percentage of GDP by the banks (PSC), broad money supply as a percentage of GDP (M2GDP), total bank assets as a percentage of GDP (TBAGDP),total domestic credit as a percentage of GDP (DCGDP) for BSDI ; stock market capiltalisation as a percentage of GDP (SMC), stock market turnover ratio expressed in percentage(SMTOR),stock market total value traded as a percentage of GDP(SMTVT), for SMDI; public or government bond capitalisation as a percentage of GDP(GB), private or corporate bond as a percentage of GDP (PB),for BMDI ; FSDI is constructed using all the indicators mentioned above.

Total domestic credit to the private sector as a ratio of Gross Domestic Product, (PSC) which refers to financial resources provided to the private sector,

such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. This measure stresses the importance of the role played by the financial sector, especially the deposit money banks, in the financing of the private economy. It isolates credit issued to the private sector from credit issued to governments, government agencies, and public enterprises. Also, it excludes credit issued by the Central Bank (Beck, Levine, & Loayza, 2000). This indicator is frequently used to assess the allocation of financial assets that the ratio of broad money to GDP cannot offer. M2GDP which is the broad money expressed as ratio of GDP indicates the level of financial depth or level of monetisation. An increase in private financial saving results in higher M2 to GDP ratio, however, with high reserve requirements, credit to the private sector which eventually is responsible for the quantity and quality of investment and therefore to economic growth, may not increase. A high domestic credit to the private sector indicates a higher level of domestic investment, indicating higher output, holding everything else constant. This measure has been used extensively in numerous works (Beck et al., 2000; King & Levine, 1993). Total bank assets as a ratio of GDP in percentage terms (TBAGDP) includes cash, government securities and interest-earning loans like mortgages, letters of credit and inter-bank loans of the banking sector. DCGDP indicates the overall credits that the banking sector is able to extend to the real sector of the economy.

Stock market capiltalisation as percentage of GDP (SMC) is equal to the value of listed shares divided by GDP. It is an indicator of the size of the stock market. Stock market turnover ratio (SMTOR) in percentages is used as the efficiency indicator of stock markets. It is classified as the ratio of the value of

total shares traded to stock market capiltalisation. Stock market total value traded (% of GDP) is equal to the total shares traded on the stock market exchange divided by GDP. This indicator measures the activity or liquidity of the stock markets.

Private bond market capiltalisation (% of GDP) is equal to the total amount of outstanding domestic debt securities issued by financial institutions and corporations as a share of GDP. Public bond market capiltalisation (% of GDP) on the other hand is equal to the total amount of public domestic securities issued by governments as a share of GDP. Both of these indicators are used to determine the efficiency of bond markets.

Bond market development indicators have not been used in the literature on financial development. Even though these indicators have been employed excessively in equity market development literature, due to the short period of data availability they have not been used as indicators for financial development. Since this study investigates the development in the various markets of the financial sector and their effects on economic growth, the study considers these indicators in the analysis in order to obtain a broader perspective of the effects of financial development on economic growth. Hence the study proposes using the bond market development indicators so as to capture the efficiency and the effectiveness of bond markets on the overall level of financial development.

Financial sector development index (FSDI) is constructed using all the indicators already explained above.

Government Expenditure (GEXP)

Government expenditure can be recurrent or capital expenditure and is defined to include all government consumption, investment, and transfer payments. In national income accounting, the acquisition by governments of goods and services for current use, to directly satisfy the individual or collective needs of the citizens is described as government final consumption expenditure or recurrent expenditure and this is to ensure smooth administration and operation of government machinery .Government acquisition of goods and services intended to create future benefits, such as infrastructure, investment or research spending, is classified as capital expenditure or government investment (government gross capital formation). These two types of government spending, on final consumption and on gross capital formation, together constitute one of the major components of gross domestic product.

Government expenditure that is not acquisition of goods and services, and instead just represents transfers of money, such as social security payments, is called transfer payments. These payments are considered to be exhaustive because they do not directly absorb resources or create output. In other words, the transfer is made without any exchange of goods or services. Examples of certain transfer payments include welfare (financial aid), social security, and government giving subsidies to certain businesses (firms). However, it is important to state that in this study, government expenditure is measured as the ratio of GDP and expressed in percentage. Government expenditure or spending can be financed by government borrowing (domestic or international), seigniorage, or taxes. Changes in government spending are a major component of fiscal policy used to achieve macroeconomic stability. For fiscal policy,

increases in government expenditure or spending are expansionary, while decreases are contractionary. John Maynard Keynes was one of the first economists to advocate government deficit spending (increased government spending financed by borrowing) as part of the fiscal policy response to an economic contraction. According to Keynesian economics, increase in government spending raises aggregate demand and increases consumption, which leads to increased production and faster recovery from recessions. Classical economists, on the other hand, believe that increased government spending exacerbates an economic contraction by shifting resources from the private sector, which they consider productive, to the public sector, which they consider unproductive. In this regard, government expenditure may have its a priori sign expectation to be positive or negative.

Real Interest Rate (RIR)

The Real Deposit Rate (R) which is the rate paid by commercial or similar banks for demand, time or savings deposits, deflated for inflation is used as a proxy for real interest rate (Acheampong, 2007; Jalil & Ma, 2008). *RIR* is expected to have a positive impact on the output level in accordance with the theoretical predictions of the McKinnon-Shaw proposition.

Capital stock (K) or (GFCF)

Gross fixed capital formation (K), formerly gross domestic fixed investment includes plants, machinery and equipment. It also includes the construction of roads, railways, and others such as schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings and all these are necessary for economic growth. In this study, capital stock is defined

broadly to include physical and human capital, according to endogenous growth theory. The variable is used as a proxy for capital stock. Gross fixed capital formation as a proxy for capital has been used in several other studies such as Balasubramanyam, Salisu, and Sapsford (1996), Kohpaiboon (2006), Njindan Iyke & Takumah, (2015). Gross fixed capital formation as a percentage of GDP (a proxy for capital stock) is expected to positively affect real GDP growth, according to both neoclassical and endogenous growth predictions. The higher the rate of investment the higher the growth rate of the economy, ceteris paribus.

Inflation Rate (INF)

Inflation is defined as a sustained increase in the general prices of goods and services over a period of time. A host country's economic instability can be a major deterrent to economic growth. Price stability is an indicator of a stable macroeconomic environment of a country. Usually, high rate of inflation in a country can reduce the return on investment and an indicator of macroeconomic instability and considered a sign of internal economic tension and unwillingness of the government to balance its budget and failure of the central bank to conduct appropriate monetary policy (Schneider & Frey, 1985). Inflation (INF) as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Inflation rate is a reflection of macroeconomic instability. A high rate of inflation is generally harmful to growth because it raises the cost of borrowing and thus lowers the rate of capital investment. However, at low levels of inflation, the likelihood of such a trade-off between inflation and growth is

minimal. Inflation is therefore used as an indicator to capture macroeconomic instability (Asiedu & Lien, 2004; Asiedu, 2013; Ayibor, 2012).

Financial Openness (FO)

Financial openness is the situation where existing administrative and market-based restrictions on capital movement across borders have been removed. Financial openness also includes the introduction of measures to attract foreign capital and reduce the discrimination against foreign financial institutions operating in domestic markets.

When a country implements capital account liberalisation, it first ensures openness, and then financial integration will gradually be achieved. Ideally, that country will eventually have a financial market structure and products similar to those of overseas markets. Domestic financial markets effectively become part of the world market, synchronising interest rate movements, saving and investment activities, and the accumulation of physical capital stocks.

To investigate the effect of financial openness on financial development in this study, financial openness is measured by employing the capital account openness index (KAOPEN), constructed by Chinn and Ito (2008). The index has the advantage of capturing both the extensity and intensity of capital controls with an extensive coverage of countries and years, and is widely applicable. The index considers four types of restrictions, i.e., presence of multiple exchange rates, restrictions on current and capital account transactions, and requirement of the surrender of export proceeds as shown in AREAER.

Chinn and Ito's (2002, 2006 and 2008) KAOPEN uses the AREAER table to identify an "extensive" indicator of financial globalisation that relies on

a data reduction exercise. To this end, an index based on the *AREAER* binary series is constructed with the objective of incorporating the intensity of capital controls. According to Chinn and Ito's (2002, 2006 and 2008), their index on capital controls is the first standardised principal component, of the aforementioned *ki* through *k.4* binary variables. Again, in order to focus on the effect of capital account openness as opposed to controls- they reverse the values of the binary variables of the AREAER series, such that the variable takes a value of unity when the restrictions are non-existent. Moreover, for controls on capital transactions (k_3) Chinn and Ito utilised the share of a five year window that controls were not in effect *(SHAREk)*.

Specifically, the capital account openness variable for year t is proportion of five years encompassing year t and the preceding four years that the capital account was open: They use principal component analysis on three categorical indicators of financial current account restrictions (current account restrictions, export proceeds surrender requirements, and presence of multiple exchange rates) plus *SHARE,* which takes the rolling average of IMF Binary over the five-year window:

$$SHARE_{3t} = \left(\frac{k_{3,t} + k_{3,t-1} + k_{3t-2} + k_{3,t-3} + k_{3,t-4}}{5}\right)$$

Hence, the index capital "openness" is $KAOPEN_t$ = The first standardised principal component of four AREAER table variables. k_{ii}, $k2l$,$SHAREkl$,, andk_4,

Higher scores indicate greater openness. A higher KAOPEN indicates less regulation and more openness in the capital account (Qin & Luo, 2014). The index is expected to be positively related to financial ;development since

the more open a country's capital account transactions, the more capital flows the economy encounters in order to increase investment and hence growth via financial ;development, $\lambda_2 > 0$.

Trade openness (TOPN)

Trade openness refers to the degree to which nationals and foreigners can transact trade without artificial (that is, governmentally imposed) costs, including delays and uncertainty. Trade openness is often hypothesised to raise growth through several channels from the literature such as, greater access to a variety of inputs for production, access to advanced technology from abroad, possibilities of catch-up, and access to broader markets that raise the efficiency of domestic production through increased specialisation. Various measures of openness have been proposed and tested, with no single 'best' measure emerging. Aseidu (2013) in examining Trade Liberalisation and Growth: The Ghanaian Experience used the sum of exports and imports of goods and services measured as ratio to GDP as a measure of openness. Frequently used measures include the ratio of total trade to GDP and changes in terms of trade. This study will, however, deviate from these measures and adopt Composite Trade Intensity (CTI) as a measure of trade openness which was first suggested and used by Squalli and Wilson (2006). The CTI is a combination of Trade Intensity (TI) and Relative World Trade Tntensity (RWTI). By combining TI and RWTI, Squalli and Wilson (2006) derive a CTI index which they calculated as follows:

$$CTI = \frac{1}{\bar{X}}[TI \times RWTI]$$

$$CTI = \frac{1}{\bar{X}}[\frac{(X+M)_i}{GDP_i} \times \frac{(X+M)_i}{\sum_{j=1}^{n}(X+M)_j}$$

But $\bar{x} = 1/n$ and $\sum_{j=1}^{n}(X + M)_j = 2(X + M)_i$

$$CTI = \frac{n[(X + M)_i \times (X + M)_i]}{GDP_i 2(X + M)_i}$$

$$CTI = \frac{(X + M)_i^2}{GDP_i 2(X + M)_i}$$

$$CTI = \frac{(X + M)_i}{2(GDP)}$$

Where X_i is the exports of a country of interest in this study (Ghana), M_i is imports, GDP_i is gross domestic product of a country of interest; and n is the sample of countries assuming a cross country studies. However, this study is country – specific study, and so n is equal to one. Trade openness enhances competition, promotes large markets, enhances technology transfer and hence efficiency in production. It is thus expected that trade openness will have a positive relationship with economic growth. Therefore, its coefficient is expected to be positive. Thus, $\beta_6 > 0$

Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is defined as investment made to acquire a lasting management interest possibly 10 percent or more of voting stock in enterprises operating outside of the economy of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown on the balance of payments. It is expressed as a ratio to GDP. Foreign Direct Investment is considered as an inflow of foreign capital to complement domestic investment and production and hence improving economic performance. Following the works of Lipsey (2001), Frimpong and Oteng-Abayie (2006); Asiedu (2013), and Esso (2010), this study uses FDI as a share of GDP to measure foreign direct investment. The role of foreign direct

investment (FDI) has been widely recognised as a growth-enhancing factor in developing countries. It is therefore expected that an increase in foreign direct investment leads to an increase in total investment and hence increase in total output and its rate of growth. Thus, its coefficient β_9 is expected to be positive. Thus $\beta_9 > 0$

Poverty Level (POV)

According to the United Nations, poverty is "the total absence of opportunities, accompanied by high levels of undernourishment, hunger, illiteracy, lack of education, physical and mental ailments, emotional and social instability, unhappiness, sorrow and hopelessness for the future".

Poverty is also characterized by a chronic shortage of economic, social and political participation, relegating individuals to exclusion as social beings, preventing access to the benefits of economic and social development and thereby limiting their cultural development. However, in this study, poverty is measured by household final consumption expenditure per capita which is also known as private per capita consumption and is defined to include the market value of all goods and services, including durable products (such as cars, washing machines, and home computers), purchased by households. It excludes purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenditure of nonprofit institutions serving households, even when reported separately by the country. This item also includes any statistical discrepancy in the use of resources relative to the supply of resources. Data are in current U.S. dollars.

However, in this study, household final consumption expenditure per capita is used to capture poverty levels or living standard of people. Therefore, decreases in expenditure (low cost of living) in acquiring the same basket of goods and services over given period of time means a reduction in poverty levels or improvement in living standard of people, all other things being equal. On the other hand, a rise in cost of living is an indication of increase in poverty levels or a falling standard of living of people. Again a fall in consumption expenditure means an increase in savings for investment which will ultimately improve on the lives of people. Thus, from national income accounting, income is either consumed or saved and therefore savings and investment are equated in the equilibrium.

To this end, MacKinnon and Shaw (1973) argue that development in financial sector allows more access of financial services to the poor, ensure price stability, and also better opportunities to invest in more productive projects which will enhance the wellbeing of the poor. It is therefore expected that financial development will have negative and significant effect on household final consumption expenditure per capita (cost of living) and hence poverty reduction.

Sources of Data and Estimation Techniques

The study employed secondary data. Quarterly time series data which span from 1990:1 to 2015:4 were used. The series were drawn from World Bank's World Development Indicators, 2015, Ghana Stock Exchange, 2013 and Bank of Ghana, 2015. Specifically, private sector credit as a percentage of GDP by the banks (PSC), broad money supply as a percentage of GDP (M2GDP),

total bank assets as a percentage of GDP (TBAGDP),total domestic credit as a percentage of GDP (DCGDP) for BSDI as well as INF and RIR were obtained from Bank of Ghan,2015; stock market capiltalisation as a percentage of GDP (SMC), stock market turnover ratio expressed in percentage(SMTOR),stock market total value traded as a percentage of GDP(SMTVT), for SMDI as well as public or government bond capiltalisation as a percentage of GDP(GB), and private or corporate bond as a percentage of GDP (PB),for BMDI were obtained from Ghana Stock Exchange, 2013; FSDI was constructed using all the indicators mentioned above. Again, data on real GDP, TOPN, GFCF, GEXP, POV, and FDI were obtained from Word Bank's WDI, 2015.

Further, data on the variables were originally in annual series from 1990 to 2015 which were woefully inadequate for a study of this nature and hence quarterly series had to be interpolated and extrapolate using Gandolfo (1981) statistical algorithm, and period average growth rates were used to generate the missing ones.

The study employed the Maximum Likelihood Estimation (MLE) technique to examine the relationships among the variables of interest in the study. The MLE technique is a statistical method for estimating population parameters (such as the mean and variance) from sample data, which selects as estimates, those parameter values maximizing the probability of obtaining the observed data. The major advantages associated with this estimation technique are that: the maximum likelihood estimation procedure can be applied to a wide variety of models and it generally yields estimators with excellent asymptotic properties (Davidson & MacKinnon, 2004). In addition, several statistical software packages provide excellent algorithms for maximum likelihood

estimates and for many commonly used distributions. This helps to mitigate the computational complexity of the MLE.

In order to examine the direction of causality between financial development and financial openness, economic growth and financial development, poverty reduction and financial development, as well as other explanatory variables, the study applied Granger causality test within the framework of cointegration and error-correction models. The empirical procedure involves the following steps. First of all, the study investigated the time series properties of the data by using the Augmented Dickey–Fuller (ADF) and the Phillip-Perron (PP) tests. The unit roots test was used to check the stationarity property of the data. In the second step, it tested for cointegration using the autoregressive distributed lag (ARDL) procedure developed by (Pesaran, Shin, & Smith, 2001). Also, the stability and diagnostic test statistics of the ARDL model is examined to ensure the reliability and the goodness of fit of the model. Finally, the study employed granger-causality to test for causality. The causality test is preceded by cointegration testing since the presence of cointegrated relationships have implications for the way in which causality testing is carried out.

Method selection for Time Series Data Analysis

According to Min and Guna (2018), the following is a general methodological framework for time series analysis.

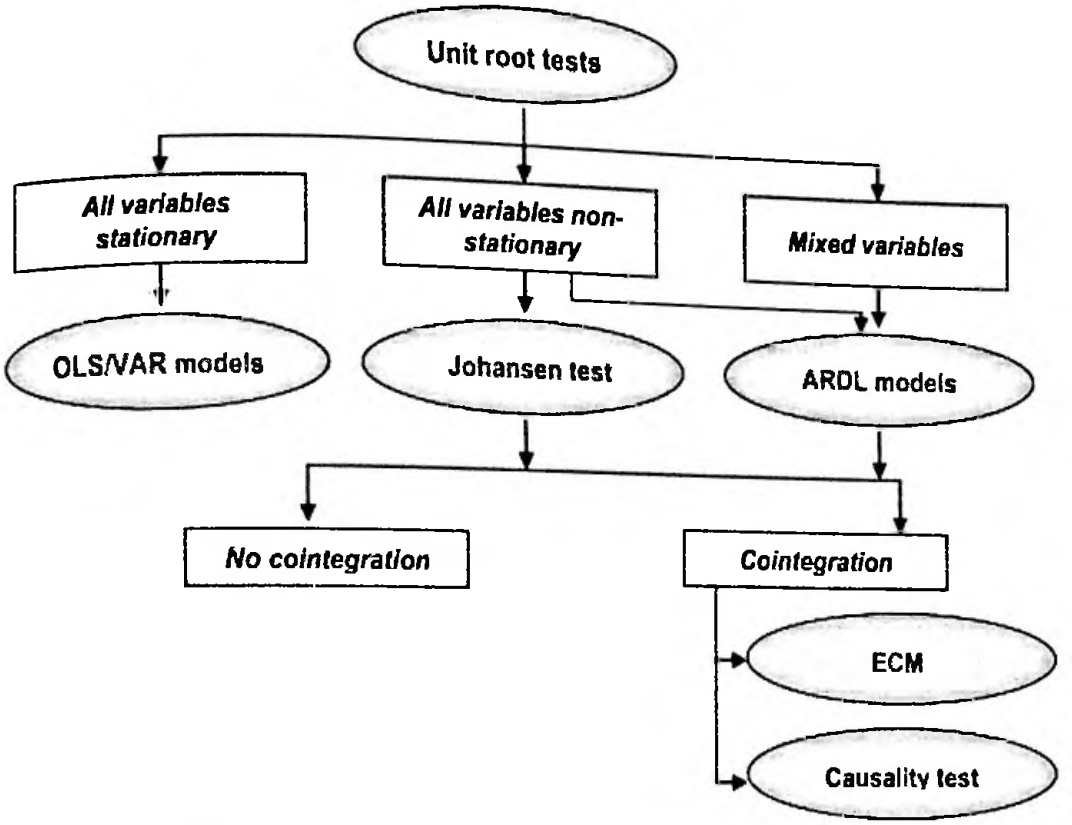

Figure 12: Method selection for time series data analysis

Note: OLS: Ordinary least squares; VAR: Vector autoregressive; ARDL: Autoregressive distributed lags; ECM: Error correction models.

To begin with, the non-stationary variables can be made stationary by taking first difference. Similarly, the non-stationary data with a persistent long-run trend can be made stationary with either i) putting time variable in the regression or ii) extracting trends and cycles from the single series by using popular filtering techniques such as Hodrick Prescott (HP) filter. Nevertheless, it should be noted that the long-run relationship or information of the variables

may be lost when we modify them to make stationary such as by differencing, de-trending or filtering.

Ordinary least square (OLS) method

The first step to start the time series analysis is to conduct unit roots test. If unit roots test results show that all variables being analysed are stationary, then OLS method can be used to determine the relationship between the given variables. As mentioned above, a non-stationary time series can be converted into a stationary series by differencing. If a time series becomes stationary after differencing one time, then the series is said to be integrated of order one and denoted by I(1). Similarly, if a time series has to be differenced two times to make it stationary, then it is called integrated of order 2 and written as I(2). As the stationary time series need not to be differenced, it is denoted by I (0).

Taking difference of non-stationary time series and using OLS method after making all the variables stationary may seem to be an easy way to analyze the relationship. However, the difference represents only the short-run change in the time series but totally misses out the long-run information. Hence, this method is not suggested for the analysis of non-stationary variables.

Vector autoregressive (VAR) model

Vector Autoregressive (VAR) model allows the feedback or reverse causality among the dependent and independent regressors using their own past values. In the general VAR model, no exogenous variables require as it assumes all the regressors endogenous.

Choosing appropriate lag length is important in VAR modeling. Optimal number of lags can be selected by using available lag length selection criteria.

relationship, Granger (1969) has developed causality test method. If current and lagged values of X improve the prediction of the future value of Y, then it is said that X 'Granger causes' Y.

Diagnostic tests and goodness of fit of the time series model

To make the estimated model robust and unbiased, we need to determine the fitness of the model through checking goodness of fit statistics and conducting diagnostics tests.

Goodness of fit test

A rough impression of the robustness of estimated regression coefficients can be made by examining how well the regression line explains the data, whether there is a serial correlation in residuals and whether the overall model is significant, among others. Goodness of fit test values is displayed together with the estimated coefficients by almost all types of software.

Common tests for goodness of fit include R^2, which shows a correlation in bivariate case and hence the value closer towards 1 is considered to be better. In a multivariate regression, adjusted R^2 is chosen instead of R^2. R^2 increases with the increase in the number of variable while adjusted R^2 increases only when the new variable improves the prediction power. Durbin Watson (DW) statistics indicate whether there is an autocorrelation in residuals. If the value of DW is near to two, then model is considered to be 'autocorrelation free'.

Diagnostic tests

Diagnostic tests tell us about the robustness of estimated coefficients. Diagnostic test statistics are generally not reported automatically by software

(i.i.d). Therefore, letting $(\alpha - 1)$, to be equal to ρ and by controlling for serial correlation by adding lagged first differenced to equation (47) gives the ADF test of the form:

$$\Delta Y_t = \mu + \rho Y_{t-1} + \gamma t + \sum_{i=1}^{p} \beta_i \Delta Y_{t-1} + \varepsilon_t \qquad (48)$$

Where Y_t denotes the series at time t, Δ is the difference operator, μ, γ, and β_i are the parameters to be estimated and ε is the stochastic random disturbance term.

For the ADF and the PP tests the null hypothesis that a series contains unit roots (non-stationary) against the alternative hypothesis of no unit roots (stationary). That is:

$H_0: \rho = 0$ (Y_t is non-stationary)

$H_1: \rho < 0$ (Y_t is stationary)

If the tau statistic is less negative than the critical values, the null hypothesis is accepted and the conclusion is that the series is non-stationary. Conversely, if the tau value or t-statistic is more negative than the critical values, the null hypothesis is rejected and the conclusion is that the series is stationary.

Tests for Cointegration

Most time series data are non-stationary with a unit roots at levels, first differencing appears to provide the appropriate solution to the problems. However, first differencing has the tendency of eliminating all the long-run information which economists are invariably interested in. Granger (1986) identified a link between non-stationary processes and preserved the concept of a long-run equilibrium. Two or more variables are said to be cointegrated (there

is a long-run equilibrium relationship), if each of the series taken individually is non-stationary with I (1), while their linear combination is stationary with I (0).

Justification and use of Autoregressive Distributed Lag (ARDL) Approach to Cointegration

In order to analyse the long-run relationships as well as the dynamic interactions among the various variables of interest empirically, the autoregressive distributed lag cointegration procedure developed by (Hashem Pesaran, Shin, & Smith, 2001b) was used. The choice of ARDL to estimate the model was informed by the following reasons:

First, The ARDL cointegration procedure is relatively more efficient in small sample data sizes as is the case in this study. This study covers the period 1990–2015 inclusive. Thus, in annual terms, the total observation for the study is 25 which is relatively small and therefore the need to resort to quarterly series.

Second, The ARDL enables the cointegration to be estimated by the ordinary least square (OLS) method once the lag of the model is identified. This is however, not the case of other multivariate cointegration techniques such as the Johansen Cointegration Test developed by (Johansen & Juselius, 1990). This makes the ARDL procedure very simple.

Third, The ARDL procedure does not require the pretesting of the variables included in the model for unit roots compared with other techniques such as the Johansen approach. It is applicable regardless of whether the variables in the model are purely I (0), purely I (1) or mutually cointegrated. The procedure will however crash in the presence of I (2) series.

Further assuming that a unique long-run relationship exists among the variables, the conditional VECM (25) now becomes:

$$\Delta z_t = \alpha_{y0} + \beta t + \delta_{yy} y_{t-1} + \delta_{xx} x_{t-1} + \sum_{i=1}^{p-1} \lambda_i \Delta y_{t-i} + \sum_{i=1}^{p-1} \xi_i \Delta x_{t-i} + \varepsilon_{yt} \qquad t = 1, 2, \ldots, T \tag{52}$$

On the basis of the foregoing exposition, the conditional VECM of interest can be specified as equations (53), (54), and (55) respectively.

Thus:

Model for financial development and financial openness:

$$\Delta \ln FSDI_t = \alpha_0 + \delta_1 \ln FSDI_{t-1} + \delta_2 \ln FO_{t-1} + \delta_2 \ln TOPN_{t-1} + \delta_2 In\ RGDP_{t-1} + \delta_3 RIR_{t-1} + \delta_4 INF_{t-1} + \delta_5 \ln GEXP_{t-1} + \sum_{i=1}^{p} \beta_{1i} \Delta \ln RGDP_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta \ln FO_{t-j} + \beta_{3j} \Delta \ln TOPN_{t-j} + \beta_{4j} \Delta \ln RGDP_{t-j} + \sum_{k=1}^{q} \beta_{5k} \Delta RIR_{t-k} + \sum_{l=1}^{q} \beta_{6l} \Delta INF_{t-l} + \sum_{m=1}^{q} \beta_{7m} \Delta \ln GEXP_{t-m} + \varepsilon_t \tag{53}$$

Model for financial development and growth, the model is specified as:

$$\Delta \ln RGDP_t = \alpha_0 + \delta_1 \ln RGDP_{t-1} + \delta_2 \ln BSDI_{t-1} + \delta_2 \ln SMDI_{t-1} + \delta_2 \ln BMDI_{t-1} + \delta_3 \ln GEXP_{t-1} + \delta_4 RIR_{t-1} + \delta_5 \ln GFCF_{t-1} + \delta_6 INF_{t-1} + \delta_7 \ln TOPN_{t-1} + \delta_8 \ln FDI_{t-1} + \sum_{i=1}^{p} \beta_{1i} \Delta \ln RGDP_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta \ln BSDI_{t-j} + \beta_{3j} \Delta \ln SMDI_{t-j} + \beta_{4j} \Delta \ln BMDI_{t-j} + \sum_{k=1}^{q} \beta_{5k} \Delta \ln GEXP_{t-k} + \sum_{l=1}^{q} \beta_{6l} \Delta RIR_{t-l} + \sum_{m=1}^{q} \beta_{7m} \Delta \ln GFCF_{t-m} + \sum_{n=1}^{q} \beta_{8n} \Delta \ln INF_{t-n} + \sum_{p=1}^{q} \beta_{9p} \Delta \ln TOPN_{t-p} + \sum_{z=1}^{q} \beta_{10z} \Delta \ln TOPN_{t-z} + \varepsilon_t \tag{54}$$

Model for financial development and poverty nexus, the specification is:

$$\Delta \ln POV_t = \alpha_0 + \delta_1 \ln POV_{t-1} + \delta_2 \ln FSDI_{t-1} + \delta_3 \ln RGDP_{t-1} + \delta_4 INF_{t-1} + \delta_5 \ln TOPN_{t-1} + \delta_6 In\ GEXP_{t-1} + \delta_7 InGFCF_t + \sum_{i=1}^{p} \beta_{1i} \Delta \ln POV_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta \ln FSDI_{t-j} + \beta_{3j} \Delta \ln RGDP_{t-j} + \beta_{4j} \Delta INF_{t-j} + \sum_{k=1}^{q} \beta_{5k} \Delta \ln TOPN_{t-k} + \sum_{l=1}^{q} \beta_{6l} \Delta In\ GEXP_{t-l} + \sum_{m=1}^{q} \beta_{7m} \Delta \ln GFCF_{t-m} + \varepsilon_t \quad (55$$

Where δ_i are the long run multipliers, α_0 is the drifts, and ε_t are white noise errors.

Bounds Testing Procedure

The first step in the ARDL bounds testing approach is to estimate equations (53), (,54), and (55) by ordinary least squares (OLS) in order to test for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables, that is:

$H_N: \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = 0$ against the alternative

$H_A: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq 0.$

The test which normalizes on FSDI is denoted by:

$F_{FSDI}(LFSDI \mid LFO, LTOPN, LRGDP, RIR, INF, andLGEXP))$ RGDP is

denoted

$F_{RGDP}(LRGDP \mid LBSDI, LSMDI, LBMDI, LGEXP, RIR, LGFCF, INF, LTOPNandLFDI)$

POVi $F_{POV}(LPOV \mid LFSDI, LRGDP, INF, LTOPN, LGEXPandLGFCF)$ Two asymptotic critical values bounds provide a test for cointegration when the independent variables are I(d) (where $0 \leq d \leq 1$): a lower value assuming the regressors are I(0), and an upper value assuming purely I(1) regressors. If the F-statistic is above the upper critical value, the null hypothesis of no long-run relationship can be rejected irrespective of the orders of integration for the time series. Conversely, if the F-statistic falls below the lower critical value the null hypothesis cannot be rejected. Finally, if the statistic falls between the lower and upper critical values, the result is inconclusive and depends on whether the underlying variables are I(0) or I(1). This necessitates the testing for unit root on the variable under investigation (Pesaran & Pesaran, 1997). The approximate critical values for the F-test can be obtained from Pesaran and Pesaran, 1997, p.478). However, given that Pesaran's critical values are based on simulated large sample size, this study will use the critical values developed by (Narayan, 2004) since it is more appropriate for small samples.

After the confirmation of the existence of long run relationship between the variables in the model, the ARDL methodology estimates $(m + 1)^{k+1}$ number of the regressors. Where m is the maximum number of lags and k is the number of the variable in the equation (Pesaran & Pesaran, 1997b; Shrestha & Chowdhury, 2005a). The order of lags of the ARDL models are selected using, either, Schawrtz-Bayesian Criteria, Akaike's Information Criteria the $\overline{R^2}$ criteria or the Hannan and Quinn criteria. The SBC uses the smallest possible lag length and is considered as most parsimonious model whereas the AIC chooses the maximum necessary lag length (Shrestha & Chowdhury, 2005).

In the second stage of the ARDL bounds approach, once cointegration is established, the restricted or conditional ARDL (p, q_1, q_2, q_3,,,,,,,,,, q_n) of the long-run models for $FSDI_t$, $RGDP_t$,. POV_t, can be estimated as:

$$\begin{aligned}\ln FSDI_t = \alpha_0 &+ \sum_{i=1}^{p} \delta_1 \ln FSDI_{t-i} + \sum_{i=1}^{q1} \delta_2 \ln FO_{t-i} + \sum_{i=1}^{q2} \delta_3 \ln TOPN_{t-i} \\ &+ \sum_{i=1}^{q3} \delta_4 \ln RGDP_{t-i} + \sum_{i=1}^{q4} \delta_5 RIR_{t-i} + \sum_{i=1}^{q5} \delta_7 INF_{t-i} \\ &+ \sum_{i=1}^{q6} \delta_8 InGEXP_{t-i} \\ &+ \gamma_t \end{aligned} \tag{56}$$

$$\begin{aligned}\ln RGDP_t = \alpha_0 &+ \sum_{i=1}^{p} \delta_1 \ln RGDP_{t-i} + \sum_{i=1}^{q1} \delta_2 \ln BSDI_{t-i} + \sum_{i=1}^{q2} \delta_3 \ln SMDI_{t-i} \\ &+ \sum_{i=1}^{q3} \delta_4 \ln BMDI_{t-i} + \sum_{i=1}^{q4} \delta_5 \ln GEXP_{t-i} + \sum_{i=1}^{q5} \delta_6 RIR_{t-i} \\ &+ \sum_{i=1}^{q6} \delta_7 \ln GFCF_{t-i} + \sum_{i=1}^{q7} \delta_8 \ln F + \sum_{i=1}^{q8} \delta_9 \ln TOPN_{t-i} \\ &+ \sum_{i=1}^{q9} \delta_{10} \ln FDI_{t-i} \\ &+ \varepsilon_t \end{aligned} \tag{57}$$

$$\Delta \ln RGDP_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \ln RGDP_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta BDI_{t-j} + \sum_{j=1}^{q} \beta_{3j} \Delta SMDI_{t-j} + \sum_{j=1}^{q} \beta_{4j} \Delta BMDI_{t-j} + \sum_{k=1}^{q} \beta_{5k} \Delta GEXP_{t-k} + \sum_{l=1}^{q} \beta_{6l} \Delta RIR_{t-l} + \sum_{m=1}^{q} \beta_{7m} \Delta GFCF_{t-m} + \sum_{n=1}^{q} \beta_{8n} \Delta INF_{t-n} + \sum_{p=1}^{q} \beta_{9p} \Delta TOPN_{t-p} + \sum_{z=1}^{q} \beta_{10z} \Delta FDI_{t-z} + \rho\, ECM_{t-1} + \varepsilon_t \quad (60)$$

$$\Delta \ln POV_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \ln POV_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta FSDI_{t-j} + \sum_{j=1}^{q} \beta_{3j} \Delta RGDP_{t-j} + \sum_{j=1}^{q} \beta_{4j} \Delta INF_{t-j} + \sum_{k=1}^{q} \beta_{5k} \Delta TOPN_{t-k} + \sum_{n=1}^{q} \beta_{6n} \Delta GEXP_{t-n} + \sum_{l=1}^{q} \beta_{7l} \Delta GFCF_{t-l} + \rho\, ECM_{t-1} + \varepsilon_t \quad (61)$$

From equations (59), (60), and (61), β_i represents the short-run dynamics coefficients of the models' convergence to equilibrium and ECM_{t-1} is the Error Correction Model. The coefficients of the Error Correction Models, ρ measures the speed of adjustment to obtain equilibrium in an event of shocks to the system. The residuals from the cointegration equations lagged one period are given as:

$$ECM_t^f$$

$$= \ln FSDI_t - \alpha_0 - \sum_{i=1}^{p} \beta_{1i} \Delta \ln FSDI_{t-i} - \sum_{j=1}^{q} \beta_{2j} \Delta FO_{t-j}$$

$$- \sum_{j=1}^{q} \beta_{3j} \Delta TOPN_{t-j} - \sum_{j=1}^{q} \beta_{4j} \Delta RGDP_{t-j} - \sum_{k=1}^{q} \beta_{5k} \Delta RIR_{t-k}$$

$$- \sum_{l=1}^{q} \beta_{6l} \Delta INF_{t-l}$$

$$- \sum_{m=1}^{q} \beta_{7m} \Delta GEXP_{t-m} \qquad (62)$$

$$ECM_t^e$$

$$= \ln RGDP_t - \alpha_0 - \sum_{i=1}^{p} \beta_{1i} \Delta \ln RGDP_{t-i} - \sum_{j=1}^{q} \beta_{2j} \Delta BSDI_{t-j}$$

$$- \sum_{j=1}^{q} \beta_{3j} \Delta SMDI_{t-j} - \sum_{j=1}^{q} \beta_{4j} \Delta BMDI_{t-j} - \sum_{k=1}^{q} \beta_{5k} \Delta GEXP_{t-k}$$

$$- \sum_{l=1}^{q} \beta_{6l} \Delta RIR_{t-l} - \sum_{m=1}^{q} \beta_{7m} \Delta GFCF_{t-m}$$

$$- \sum_{n=1}^{q} \beta_{8n} \Delta INF_{t-n}$$

$$- \sum_{p=1}^{q} \beta_{9p} \Delta TOPN_{t-p}$$

$$- \sum_{z=1}^{q} \beta_{10z} \Delta FDI_{t-z} \qquad (63)$$

$$ECM_t^p = \ln POV_t - \alpha_0 - \sum_{i=1}^{p} \beta_{1i} \Delta \ln POV_{t-i} - \sum_{j=1}^{q} \beta_{2j} \Delta FSDI_{t-j} -$$

$$\sum_{j=1}^{q} \beta_{3j} \Delta RGDP_{t-j} - \sum_{j=1}^{q} \beta_{4j} \Delta INF_{t-j} - \sum_{k=1}^{q} \beta_{5k} \Delta TOPN_{t-k} -$$

$$\sum_{l=1}^{q} \beta_{6l} \Delta GEXP_{t-l} -$$

$$\sum_{m=1}^{q} \beta_{7m} \Delta GFCF_{t-m} \quad (64)$$

Engle and Granger (1987) argued that when variables are cointegrated, their dynamic relationship can be specified by an error correction representation in which an error correction term (ECM_t) computed from the long-run equation must be incorporated in order to capture both the short-run and long-run relationships. The error correction term indicates the speed of adjustment to long-run equilibrium in the dynamic model. In other words, its magnitude shows how quick the variables converge to equilibrium when they are disturbed. It is expected to be statistically significant with a negative sign. The negative sign implies that any shock that occurs in the short run will be corrected in the long-run. The larger the coefficients of the error correction term in absolute terms, the faster the convergence to equilibrium.

To ensure the goodness of fit of the model, diagnostic and stability tests are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedasticty associated with the selected model. Pesaran and Pesaran (1997) suggested that conducting a stability test is of great importance and must not be ignored. This technique is also known as cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ). The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points. If the plots of the CUSUM and CUSUMSQ statistics stay within the critical bounds of five percent level of significance, the null hypothesis of stable coefficients in a given regression cannot be rejected.

Granger Causality Tests

The study of causal relationships among economic variables has been one of the main objectives of empirical econometrics. According to Engle and Granger (1987), cointegrated variables must have an error correction representation. "Granger causality" is a term for a specific notion of causality in time series analysis. A variable say X Granger-causes say Y if Y can be explained or predicted using the histories of both X and Y than it can, using the history of Y alone. Grange-causality is thus, a powerful tool, in that it allows one to test for things that one might otherwise assume away or otherwise taken for granted. One of the implications of Granger representation theorem is that if non-stationary series are cointegrated, then one of the series must granger cause the other (Gujarati, 2009). To examine the direction of causality in the presence of cointegrating vectors, Granger causality is conducted based on the following:

$$\Delta Y_t = \delta_0 + \sum_{i=1}^{p} \beta_{1i}\, \Delta Y_{t-i} + \sum_{i=0}^{p} \emptyset_{1i}\, \Delta X_{t-i} + \omega_{1i} ECT_{t-1} + u_t \qquad (65)$$

$$\Delta X_t = \delta_0 + \sum_{i=1}^{p} \beta_{2i}\, \Delta X_{t-i} + \sum_{i=0}^{p} \emptyset_{2i}\, \Delta Y_{t-i} + \omega_{2i} ECT_{t-1} + v_t \qquad (66)$$

Where ΔY and ΔX are the non-stationary dependent and independent variables, ECT is the error correction term, $\omega_{1i}$and ω_{2i} are the speed of adjustments, p is the optimal lag order while the subscripts *t* and *t-i* denote the current and lagged values. If the series are not cointegrated, the error correction terms will not appear in equations (65) and (66). To find out whether the independent variable (X) Granger-causes the dependent variable (Y) in equation (65), we examine the joint significance of the lagged dynamic term by testing the null hypothesis:

$$H_0 = \emptyset_{1i} = 0$$

Implying that the explanatory variable (X) does not granger cause the dependent variable (Y), against the alternative hypothesis that

$$H_1 = \emptyset_{1i} \neq 0$$

Implying that the explanatory variable (X) granger causes the dependent variable (Y)

Similarly, to find out whether the independent variable (*Y*) granger-cause the dependent variable (*X*) in equation (66), we examine the significance of the lagged dynamic term by testing the null hypothesis:

$$H_0 = \emptyset_{2i} = 0$$

Implying that the independent variable (Y) does not granger cause the dependent variable (X), against the alternative hypothesis that

$$H_1 = \emptyset_{2i} \neq 0$$

Implying that the explanatory variable (Y) granger causes the dependent variable (X)

Using the standard F-test or Wald statistic, four possibilities exist: First, rejection of the null hypothesis in equation (65) but failing to reject the null in equation (66) at the same time implies unidirectional causality running from X to Y. Second, a rejection of the null hypothesis in equation (66) but at the same time failing to reject the null in equation (65) implies unidirectional causality running from Y to X. Third, simultaneous rejection of the two null hypotheses indicates bi-directional causality. Fourth, simultaneous failure to reject the two null hypotheses indicates independence or no causality between the variables of interest.

Data Analysis

The study employed both descriptive and quantitative analysis. Charts such as graphs and tables were employed to aid in the descriptive analysis. Unit roots tests were carried out on all variables to ascertain their order of integration. Furthermore, the study adopted ARDL econometric methodology for cointegration introduced and popularised by Pesaran et al (2001) to obtain both the short and long-run estimates of the variables involved. All estimations were carried out using Stata 13 and E-views 9.0 packages.

Chapter Summary

This chapter developed and presented the methodological framework suitable for conducting the study. The study followed the standard literature of Athukorala, Jogwanich and Kohpaiboon (2004); Mansouri (2005); Asiedu (2013); Sakyi (2011); and Eduboah (2013) to specify the econometric model for economic growth. The model was developed from the theoretical formulations of the endogenous growth theory .Quarterly time-series data on real GDP, financial development (FSDI),banking sector development index (BSDI),stock market development index (SMDI),bond market development index (BMDI),government expenditure as a percentage of GDP (GEXP), real interest rate (RIR), gross fixed capital formation (GFCF) inflation (INF), trade openness (TOPN) and foreign direct investment (FDI),poverty (POV), and financial openness (FO) from 1990:1 to 2015:4 was used for the study. Stationarity test was conducted using ADF and PP tests. Moreover, ARDL econometric methodology was used to examine the long-run and short-run dynamics among

the variables. Finally, the chapter used the Granger-causality technique to determine whether there is direction of causality among the variables.

CHAPTER FIVE

EFFECTS OF FINANCIAL OPENNESS ON FINANCIAL DEVELOPMENT

Introduction

This chapter presents the estimation results and the analysis of the effects of financial openness on financial development in Ghana. The starting point is to look at the basic descriptive statistics of the two main variables, financial openness (FO) and the financial sector development index (FSDI), as well as other control variables which affect financial development. This is followed by unit roots tests results involving Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. Here, tests with constant only and tests with constant and trend of both ADF and PP are also presented.

Again, Bounds Test for Cointegration results and the short - run and the long - run results of the main variables of interest, using Autoregressive Distributed Lag (ARDL) approach to cointegration are presented and discussed as well as the results of Granger Causality tests. The chapter also dealt with post estimation tests and the stability tests. These results are discussed in relation to the hypotheses of the study.

Descriptive Statistics

TABLE 2: Descriptive Statistics of the variables

	FSDI	FO	TOPN	RGDP	RIR	INF	GEXP
Mean	41929.12	-1.3297	19.4496	4.46E+09	1.0568	4.8319	3.1984
Median	38372.43	-1.1888	19.2479	2.01E+09	0.7343	3.8063	2.9634
Maximum	141228.1	-0.0488	30.0254	1.23E+10	5.7353	15.5756	5.2931
Minimum	327.4967	-2.0608	10.4983	1.16E+09	-4.0440	2.1281	2.2589
Std. Dev.	30882.91	0.4208	4.6003	3.66E+09	2.0794	3.0513	0.7191
Skewness	1.050804	0.3911	0.1633	0.796105	0.3319	1.9114	1.1304
Kurtosis	4.060134	4.0154	2.6083	2.050817	3.3199	6.3781	3.6398
Jarque-Bera	23.08601	6.8451	1.0836	14.31701	2.2628	108.4407	23.0011
Probability	0.00001	0.0326	0.5817	0.000778	0.3226	0.0000	0.0000
Sum	4192912	-132.96	1944.9550	4.46E+11	105.6754	483.1901	319.8427
SumSq.Dev.	9.44E+10	17.5282	2095.0850	1.33E+21	428.0682	921.7283	51.1891
Observations	100	100	100	100	100	100	100

Note: Std. Dev. represents Standard Deviation while Sum Sq. Dev. represents Sum of Squared Deviation.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

The study computed the descriptive statistics of the relevant variables involved in the study. From Table 2 the variables have positive average values (means) with the exception of FO which has negative mean. It can also be seen from Table 2 that, financial sector development index (FSDI), financial openness (FO), trade openness(TOPN),real gross domestic product (RGDP),real interest rate (RIR),inflation rate (INF),and government expenditure (GEXP) are positively skewed, implying that majority of their values are less than their means. The minimal deviations of the variables from their means as indicated by the standard deviations demonstrate that when taking the logs of variables minimise their variances. In other words, the fluctuations are slow among these variables. Again, since the means are almost equal to their medians is an indication that the series are normally distributed

Unit Roots Test Results

Even though the bounds test (ARDL) approach to cointegration does not require the pretesting of the variables for unit roots, it is however important to perform this test to verify that the variables are not integrated of an order higher than one. The purpose is to ascertain the absence or otherwise of $I(2)$ variables to extricate the results from spurious regression. Thus, in order to ensure that some of the variables are not integrated at higher order, there is the need to complement the estimation process with unit roots tests.

For this reason, before applying Autoregressive Distributed Lags approach to cointegrtion and Granger-causality test, unit roots tests was conducted in order to investigate the stationarity properties of the data. Therefore, Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests

were applied to all the variables in levels and in first difference in order to formally establish their order of integration. To be certain of the order of integration of the variables, the test was conducted first, with constant and no time trend, and second, with constant and time trend in the model. The optimal number of lags included in the test was based on automatic selection by Schawrtz-Bayesian Criteria (SBC), Akaike Information Criteria (AIC), the $\overline{R^2}$ criteria or the Hannan and Quinn (H-Q) criteria. The study used the P-values in the parenthesis to make the unit roots decision, (that is, rejection or acceptance of the null hypothesis that the series contain unit root) which arrived at similar conclusion with the critical values.

The results of ADF and PP tests for unit roots with constant (intercept) only in the model for all the variables are presented in Table 3 and Table 4 respectively. The null hypothesis is that the series is non-stationary, or contains a unit roots. The rejection of the null hypothesis is based on the MacKinnon (1996) critical values as well as the probability values.

From the unit roots test results in Table 3, Appendix A, the null hypothesis of the presence of unit roots for all the variables in their levels with the exception of log of financial sector development index, financial openness, real interest rate, and inflation rate, cannot be rejected since the P-values of the ADF statistic are not statistically significant at any of three conventional levels of significance. However, at first difference, the rest of the variables become stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected because the P-values of the ADF statistic are statistically significant at 1 percent significant levels for all the estimates. The results of PP

test for unit roots with constant only in the model for all the variables are also presented in Table 4, Appendix A.

The unit roots test results in Table 4, Appendix A show that the series are non-stationary at levels with the exception of log of financial sector development index and real interest rate at 5 and 10 significance levels respectively. This is because the P-values of the PP statistic are not statistically significant at any of the conventional levels of significance. However, at first difference, all the variables are stationary since the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significance levels for all the series. It can be seen that the PP unit roots test results in Table 4 are in line with the results obtained from the ADF test in (Table 3, Appendix A), suggesting that all the variables are integrated of order one, I (1) with the exception of log of financial sector development index and real interest rate, and inflation rate which are integrated of order zero, I (0), when only intercept is in the model.

The results obtained for ADF test for unit roots with both constant and trend in the model for all the variables are presented in Table 5, Appendix A.

Again, from the unit roots test results in Table 5, it can be seen that all the variables are non-stationary at levels with the exception of log of financial sector development index, financial openness, real interest rate, and inflation rate. This is because the P-values of the ADF statistic are not statistically significant. However, when the variables are differenced for the first time they become stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant levels.

Table 6, Appendix A presents the unit roots test results obtained for the pp test with both constant and trend in the model. Table 6, Appendix A reveals the unit roots test results; the null hypothesis of the presence of the unit roots for all the variables in their levels with the exception of log of financial sector development index and real interest rate cannot be rejected since the P-values of the PP statistic are not statistically significant at the conventional levels of significance. However, at first difference, all the variables are stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant level for all the variables. It is therefore clear from all the unit roots test results discussed above that all the variables apart from log of financial sector development index and real interest rate which are integrated of order zero, I(0), are integrated of order one I(1). Since the test results have confirmed the absence of I (2) variables, ARDL methodology is now used for the estimation.

The subsequent sections discuss the results of cointegration test results, long-run and short-run results as well as Granger causality test results.

Bounds Test for Cointegration

In the first step of the ARDL analysis, the presence of long-run relationships in equation (2) using equation (3a) is tested. Given that the study employed quarterly data, a maximum lag length of 4 is used in the bounds test. Pesaran and Pesaran (1997a) suggest a maximum lag length of 4 for quarterly data in the bounds testing approach to cointegration. After the lag length was determined, the F-test statistic computed within the bounds test framework is compared with the upper and lower critical values in Pesaran and Pesaran

(1997a). The results of the bound test procedure for cointegration analysis between real gross domestic product and its determinant are presented in Table 7.

As show in Table 7, Appendix A, the joint null hypothesis of lagged level variables (that is, variable addition test) of the coefficients being zero (no cointegration) is rejected at 1 percent significance level. This is because the calculated F-statistic value of 9.6409 (F_{LFSDI} (.)=9.6409) exceeds the upper bound critical value of 4.43 at 99% level. This means there exists a long run relationship between financial sector development index and financial openness.

The results in Table 7, Appendix A indicate that there is a unique cointegration relationship among the variables in Ghana's financial sector development index model (equation 26) and that all the determinants of financial sector development can be treated as the "long-run forcing" variables for the explanation of financial sector development in Ghana. Since this study is based on liberal theory, $LFSDI_t$ is used as the dependent variable.

Having established the existence of long-run relationship between financial development and its determinants, the ARDL cointegration method is then used to estimate long-run parameters of equation (3).

Long-run results (FSDI is the dependent variable)

Since financial development and financial openness are cointegrated, the long-run parameters of the ARDL model are estimated and the results are presented in the Table 8, Appendix A. The long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC). The coefficients indicate the long run elasticities.

Since financial development and financial openness are cointegrated, the long-run parameters of the ARDL model are estimated and the results are presented in the Table 8, Appendix A. The long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC).

As shown in Table 8, Appendix A, all the estimated coefficients have their a priori expected signs. From the results, the coefficient of financial openness is positive and statistically significant at 1 percent significance level, indicating that if the country were to increase financial openness by 1 percent, then financial sector development index will improve by approximately 27 percent. This means that improvement in the financial openness in the form of financial liberalisation (i.e. both internal and external) has the potential for enhancing development in the financial sector in Ghana over the study period. Therefore, it can be said that the financial liberalisation effort in 1988 which was part of the overall Economic Recovery and Structural Adjustment Programmes in 1983 was a right economic decision.

Further, financial openness has been positively linked to financial development and regarded as a key form of financial liberalisation in a number of recent studies. Using cross-sectional studies to examine a wide range of countries over the period 1985-1995, Klein and Olivei (1999) determined whether opening capital accounts has an effect on financial development. With the ratio of liquid liabilities to GDP, the ratio of claims on nonfinancial private sector to GDP and the ratio of private bank to private plus central bank assets as the measures of financial development and capital account liberalisation as the measure of financial openness, they established a positive relationship between capital account liberalisation and financial development.

effect of trade openness on financial development lends support to the argument by Rajan and Zingales (2003) which claim that greater openness is associated with changes in sectoral structure that increase the demand for external finance which has the potential of enhancing the activities of financial institutions.

The results in Table 8, Appendix A, confirm most findings in many empirical studies in the literature. Specifically, it concurs with a study by Seetanah et al. (2010) who found a positive effect of trade openness on financial development for Mauritius. Huang and Temple (2005b) also investigated the effect of trade openness on financial development for 88 countries and found statistically positive effect of trade openness on financial development in the long-run for lower- income group like Pakistan and Vietnam.

Moreover, the coefficient of real gross domestic product also had positive effect on financial development and is statistically significant at 1 percent significance level. The coefficient of real gross domestic product indicates that if the country's real gross domestic product increases by 1 percent, financial sector development will increase by approximately 0.09 percent in the long-run. This means that as Ghana's real gross domestic product increases and hence real per capita income which is derived by dividing real gross domestic product by the total population also increases, individuals contributes positively to financial sector development through savings or purchasing of financial products from the financial market in Ghana. It is argued here that increasing level of income encourages the use of financial institutions and claims; therefore growth in real sectors of the economy and hence income per head is important for financial development. Thus, real per capita income which measures economic growth has a positive effect on financial development in Ghana.

studies by Bittencourt (2008) who found a negative effect of inflation on financial development for Brazil as well as Wahid et al. (2011) for Bangladesh.

Finally, the crucial role of government in promoting financial development in Ghanaian economy cannot be overemphasised and this is reflected in the long run results in the Table 8, Appendix A. Government expenditure has its expected positive sign and is statistically significant at 1 percent level of significance. Thus, a 1 percentage point increase in government's expenditure will result in improving Ghanaian financial sector by approximately 0.62 percent. Government expenditure or spending can be financed by government borrowing (domestic or international), seigniorage, or taxes. Changes in government spending are a major component of fiscal policy used to achieve macroeconomic stability.

To this end, for fiscal policy, increases in government expenditure or spending are expansionary, while decreases are contractionary. John Maynard Keynes was one of the first economists to advocate government deficit spending (increased government spending financed by borrowing) as part of the fiscal policy response to an economic contraction. According to Keynesian economics, increase in government spending raises aggregate demand and increases consumption, which leads to increased production and faster recovery from recessions. Classical economists, on the other hand, believe that increased government spending exacerbates an economic contraction by shifting resources from the private sector, which they consider productive, to the public sector, which they consider unproductive.

The long-run results indicate that any disequilibrium in the system as a result of a shock can be corrected in the long-run by the error correction term.

in the short-run in each quarter during the study period is about 65%. According to Acheampong (2007), the rule of thumb is that, the larger the error correction coefficient (in absolute terms), the faster the variables equilibrate in the long-run when shocked in the short- run.

The results from the ARDL model as displayed in Table 9, Appendix A, suggest that the ultimate effect of previous period values of financial sector development index on current values of financial development in the short-run are positive and statistically significant at 1 percent, 5 percent, and 10 percent significance levels respectively. The implication is that current values of financial development are affected by previous quarters' values of financial development in Ghana. This is expected in that previous growth and expansion in the financial sector serves as an indication of prosperity and may attract more investment leading to more growth. This result concurs with the findings in the empirical studies by Bittencourt (2008) as well as Baltagi, et al. (2007).

Again and consistent with the long-run results in Table 8, Appendix A, the coefficient of financial openness is positive and statistically significant at 5 percent significance level, indicating that if the country were to increase financial openness by 1 percent, then financial sector development index will improve by approximately 30 percent in the short-run. Further, improvement in the financial openness in the form of financial liberalisation (i.e. both internal and external) and its potential positive effects on financial sector development in Ghana over the study period is once again confirmed in the short-run. Therefore, it can be said that the financial liberalisation effort in 1988 which was part of the overall Economic Recovery and Structural Adjustment Programmes in 1983 was a right economic decision; just as in the long-run.

Also, in line with the long-run results (Table 8, Appendix A), financial openness has been positively linked to financial development and regarded as a key form of financial liberalisation in a number of recent studies. Referring to cross-sectional studies to examine a wide range of countries over the period 1985-1995, Klein and Olivei (1999) determined whether opening capital accounts has an effect on financial development. With the ratio of liquid liabilities to GDP, the ratio of claims on nonfinancial private sector to GDP and the ratio of private bank to private plus central bank assets as the measures of financial development and capital account liberalisation as the measure of financial openness, they established a positive relationship between capital account liberalisation and financial development in both the short-run and the long-run. Also, several other researchers have come by similar conclusions (Chinn & Ito, 2005; Huang, 2006; Hye & Wizarat, 2011; Jaffee & Levonian, 2001).

Again, consistent with the long-run results, the coefficient of trade openness has the theorised positive impact on financial development in the short-run. The coefficient of trade openness is statistically significant at 1 percent significant level. From the results, a 1 percentage point increase in trade openness will induce financial development to increase by approximately 0.6 percent in the short-run. This indicates the crucial role that trade liberalisation plays in Ghana's growth process through the financial sector as its coefficient is positive in the dynamic model just as in the long run model. Again, previous trade relationships between Ghana and the rest of the world influence the current trade contracts and its effects on financial sector development. This is because the coefficient of previous first quarter's trade openness, D (LTOPN (-1)) is

0.5243 and is statistically significant at 1 percent level of significance. The result means that a 1 percentage point increase in previous first quarter's trade openness will cause the financial sector development to increase by approximately 0.52 percent in the short-run during the study period.

Further, the results in Table 9, Appendix A, reveal that the current quarter's value of real GDP is affected by previous first quarter's value of real GDP. This is expected in that previous growth and expansion of the economy serves as an indication of prosperity and may attract more investment leading to more growth. The coefficient of current real gross domestic product, D (LRGDP) is positive and statistically significant at 1 percent significance level in the short-run. This means that a 1 percent increase in economic growth, as measured by real gross domestic product will lead to approximately 0.50 percent growth in the financial sector in the short-run. The result confirms the findings of Seetanah et al. (2010), where the ratio of real gross domestic product to total population (real per capita income) maintained its positive effect on financial sector development for Mauritius.

Again, consistent with the findings of Bhattacharya and Mukherjee (2002) for India, the coefficient of real interest rate in the dynamic equation maintained its expected negative sign. It is statistically significant at 1 percent significance level which is consistent with the long-run results. The result shows that a 1 percentage point increase in interest rate in the short-run will decrease financial sector development index by approximately 0.11 percent. The negative effect of interest on financial development is less severe in short-run (-0.1114) than in the long-run (-0.1293). This result is also confirmed by Cottarelli and Kourelis (1994).

Further, the results in Table 9, Appendix A, reveal that the current quarter's value of inflation rate is influenced by previous first, second, and third quarter's values of inflation rate. This is again, expected because the previous rate of inflation serves as a guide in shaping the future monetary policy actions that will be taken by the Central Bank. The coefficient of current quarter's rate of inflation also maintained its negative sign and is statistically significant at 1 percent significance level which is consistent with the long-run results. The result reveals that if inflation increases by 1 percent, financial development will decrease by approximately 0.10 percent in the short-run. Thus, the short-run and long-run results indicate that inflation has been a threat to Ghana's financial development effort. Therefore, it is not surprising that the Central Bank of Ghana has over the years, anchored achievement of price stability to inflation targeting in its monetary policy formulation. The negative effect of inflation on financial development seems more severe in short-run (-0.0996) than in the long-run (-0.0768). The results indicate how important it is to control inflation in the Ghanaian economy by putting in the appropriate policies. Its impact in both the short and long run appears to be debilitating as inflation generally proxy macroeconomic instability. Empirically, the results concur with the conclusions by Krause and Rioja (2006).

Finally, the crucial role of government in promoting financial development in Ghanaian economy cannot be overemphasised and this is reflected in the long run as well as the short-run results in the Table 8 above. Government expenditure has its expected positive sign and is statistically significant at 5 percent level of significance. Thus, a 1 percentage point increase in government's expenditure will result in improving Ghanaian financial sector

or RESET test using square of the fitted values. The model also passed the Normality test based on the Skewness and Kurtosis of the residuals. Thus, the residuals are normally distributed across observations. Finally, the estimated model passes the test for heteroscedasticity test based on the regression of squared residuals on squared fitted values.

Stability Tests

When analyzing the stability of the coefficients, the Cumulative Sum (*CUSUM*) and Cumulative Sum of Squares (*CUSUMQ*) are applied. Following Pesaran and Pesaran (1997) and vindicated by Bahmani-Oskooee, and Nasir (2004) the stability of the regression coefficients is evaluated by stability tests and the tests can determine whether or not the parameter estimates are stable over time. This stability test is appropriate in time series data, especially when one is uncertain about when structural change might have taken place. The results for *CUSUM* and *CUSUMQ* are shown in Figure 12 and Figure 13. The null hypothesis is that the coefficient vector is the same in every period and the alternative hypothesis is that the coefficient vector is not the same in every period (Bahmani-Oskooee and Nasir, 2004). The *CUSUM* and *CUSUMQ* statistics are plotted against the critical bound of 5 percent significance level. According to Bahmani-Oskooee and Nasir (2004), if the plot of these statistics remains within the critical bound of the 5 percent significance level, the null hypothesis that all coefficients are stable cannot be rejected.

predicting variations in financial sector development index, than it can using only lag values or histories of financial sector development index. However, there is no reverse causation running from financial sector development index to financial openness. In other words, Granger causality is not rejected at any of the conventional levels of significance level implying that the lag values of financial sector development index together with the lag values of financial openness do not predict variations in banking financial openness.

Further, the results suggest unidirectional causality from financial openness to financial sector development index. This implies that there exists an indirect positive feedback effect between financial openness and financial sector development following the McKinnon-Shaw (MS) thesis (i.e. Supply-leading hypothesis) which further confirms the position of the endogenous growth theorists. The implication is that financial openness predicts financial sector development and hence economic growth. On the other hand, demand – followers argue that economic growth also in turn influences financial sector development (i.e. demand-following hypothesis). The endogenous growth literature predicts a bi-directional causality between financial sector development and economic growth which is in sharp contrast to the results obtained. They argued that the financial sector contributes to economic growth through its effects on the volume of investment and efficiency of investment by: collecting and analysing costly information on entrepreneurs/investment projects; allocating credit to its highest productive use; enabling technological advancement; transforming the composition of savings to suit investment and financing of human capital formation. Similarly, economic growth also influences development of the financial sector by creating the demand for

financial services, thereby enabling the creation of new financial products and deepening of the financial system. In the empirical literature, the result is in consonance with the findings of Demetriades and Hussein (1996a), Luintel and Khan (1999), Abu-Bader and Abu-Qarn (2008a) and Lu et al. (2006).

This finding is, however, inconsistent with both the supply leading and demand pulling hypotheses already discussed. In the empirical literature, the results contradict the findings of Adam and Siaw (2010) and Quartey and Prah, (2008), in the case of Ghana. Adam and Siaw (2010) found evidence for the demand pulling hypothesis with causality running from economic growth to financial deepening when financial deepening is proxied by credit to private sector. The findings of Quartey and Prah (2008) revealed support for demand-following hypothesis, when growth of broad money to GDP ratio was used as a measure of financial development. However, when growth in domestic credit to GDP ratio, private credit to GDP ratio, and private credit to domestic credit ratio were used as proxies for financial development, they found support for the 'independent' hypothesis.

Again, the null hypothesis that log of trade openness (LTOPN) does not Granger cause log of financial sector development index (LFSDI is rejected at 1 percent significance level and there is no feedback response. This implies that the lag values of trade openness together with that of financial sector development index predict variations in financial sector development index. Thus, there is a unidirectional causality running from trade openness to financial sector development index. The results vindicate the positive and statistically significant effects that trade openness has on financial sector development both in the short-run and the long-run.

Additionally, the results in Table 11, Appendix A, show a rather conflicting outcome that log of real gross domestic product (LRGDP), a proxy for economic growth does not Granger cause financial sector development index at any of the conventional levels of significance. This result is in sharp contrast to the short-run and long-run results which indicate that economic growth impacts financial sector development positively. On the other hand, the null hypothesis that financial sector development index does not Granger cause economic growth is rejected at 1 percent significance level. This means that the past values of financial sector development index together with the past values of economic growth predict variations in economic growth. In other words, there is unidirectional causality between financial sector development and economic growth and with causality running from financial sector development index to economic growth. Hence, MS thesis is vindicated and the results give credence to the Supply-leading hypothesis theorists.

Also, the results show a rejection of the null hypothesis that real interest rate (RIR) does not Granger cause log of financial sector development index (LFSDI) at 5 percent significance level and there is no feedback response. This means that the past values of real interest rate together with the past values of financial sector development index predict variations in financial sector development index. In other words, there is unidirectional causality between real interest rate and financial sector development with causality running from real interest rate to financial sector development. The result concurs with the short-run and long-run results that real interest rate affects financial sector development in Ghana over the study period.

Again, the Granger causality test results in Table 11, Appendix A, reveal that the null hypothesis that inflation (INF) does not Granger cause log of financial sector development index (FSDI) is rejected at 1 percent significance level, implying that inflation Granger causes financial sector development. However, the null hypothesis that financial sector development does not Granger cause inflation cannot be rejected, meaning that financial sector development does not Granger cause inflation since the resulting coefficient from the test is not statistically significant at any of the conventional levels of significance. This implies that the lag values of financial sector development together with that of inflation do not predicts variations in inflation. Thus, a unidirectional causality established running from inflation to financial sector development at 1 percent significance level. The results give credence to the short-run and long-run conclusions that inflation negatively affects financial sector development in Ghana over the study period.

Finally, the results indicate that the null hypothesis that log of government expenditure (LGEXP) does not granger cause log of financial sector development index (LFSDI) is rejected at 5 percent significance level, meaning that the lag values or histories of government expenditure together with that of financial sector development index explain and predict variations in financial sector development index, than it can using only lag values of financial sector development index. However, there is no reverse response that Granger causality is not rejected implying that the lag values of financial sector development together with the lag values of government expenditure do not predict variations in government expenditure. The results suggest a

carried the expected negative sign. Also, the results imply that the variables play a significant role in influencing financial sector development in Ghana.

The long run results revealed a positive and statistically significant effect of financial openness on financial sector development. This implied a complementary relationship between the two variables. The study also found a positive and statistically significant effect of trade openness, real gross domestic product and government expenditure on financial sector development. However, inflation and real interest rate exerted a negative and statistically significant effect on financial sector development.

The short run estimates also provide evidence of positive and statistically significant effect of financial openness on financial sector development. Thus, in the short run, improvement in current financial openness and its lag leads to an increase in financial sector development. Real gross domestic product and its lag, as well as government expenditure exhibited the expected signs and exerted a positive and statistically significant effect on financial sector development in the short run. However, real interest rate, as well as inflation and its lags, maintained expected sign and exerted negative and statistically significant effects on financial sector development. Finally, the model passed the parameter stability tests of serial correlation, functional form misspecification, non-normal errors, heteroscedasticity, CUSUM and CUSUMSQ. The study, in conclusion found a unidirectional causality between financial openness and financial sector development with causality running from financial openness to financial sector development.

CHARPTER SIX

EFFECTS OF FINANCIAL DEVELOPMENT ON ECONOMIC GROWTH

Introduction

This chapter presents the estimation results and the analysis of the effects of financial sector development index (FSDI), on economic growth (RGDP) in Ghana. The starting point is to look at the basic descriptive statistics of the two main variables, real gross domestic product and the financial sector development index, which has been disintegrated into banking sector development index (BSDI), stock market development index (SMDI),bond market development index (BMDI), as well as other control variables which affect economic growth. The idea is to investigate the effects of financial sector development on economic growth whiles looking at which of the financial subsectors impacts economic growth the most. Unit roots tests results involving Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are also conducted. Again, tests with constant only and tests with constant and trend of both ADF and PP are also presented.

Further, Bounds Test for Cointegration results and the short - run and the long - run results of the main variables of interest, using Autoregressive Distributed Lag (ARDL) approach to cointegration are again presented and discussed as well as the results of Granger Causality tests. The chapter also dealt with post estimation tests and the stability tests. These results are discussed in relation to the hypotheses of the study.

Table 12: Descriptive Statistics of the Variables

	RGDP	BSDI	SMDI	BMDI	GEXP	RIR	GFCF	INF	TOPN	FDI
Mean	4.46E+09	6.28054	198944.6	0.005169	3.198427	1.056754	5.72008	4.831901	19.44955	1.00414
Median	2.01E+09	6.835084	182078.4	0.001781	2.963354	0.734284	5.625507	3.806319	19.24787	0.721712
Maximum	1.23E+10	8.303752	670146.3	0.024217	5.293115	5.735306	7.904292	15.57559	30.02538	2.511787
Minimum	1.16E+09	3.68255	1542.306	-0.0001	2.258884	-4.04401	2.921219	2.128068	10.49827	0.016951
Std. Dev.	3.66E+09	1.416624	146547	0.007107	0.71907	2.079404	1.005172	3.051293	4.600269	0.755386
Skewness	0.796105	-0.44714	1.050804	1.325322	1.13036	0.331941	-0.27437	1.91142	0.163255	0.498869
Kurtosis	2.050817	1.784577	4.060179	3.429653	3.639846	3.319894	3.48355	6.378117	2.608274	1.706605
Jarque-Bera	14.31701	9.487492	23.08639	30.0438	23.00109	2.262802	2.228878	108.4407	1.083573	11.11813
Probability	0.000778	0.008706	0.00001	0.000000	0.00001	0.322581	0.328099	0.000000	0.581708	0.003852
Sum	4.46E+11	628.054	19894463	0.516947	319.8427	105.6754	572.008	483.1901	1944.955	100.414
SumSq.Dev.	1.33E+21	198.6754	2.13E+12	0.005001	51.18909	428.0682	100.0267	921.7283	2095.085	56.49017
Observations	100	100	100	100	100	100	100	100	100	100

Note: Std. Dev. represents Standard Deviation while Sum Sq. Dev. represents Sum of Squared Deviation.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Again, the study computed the descriptive statistics of the relevant variables involved in the study. From Table 12, the variables have positive average values (means). Also, it can be seen from Table 12 that, banking sector development index (BSDI), gross fixed capital formation (GFCF) are negatively skewed, implying that majority of their values are greater than their means. On the other hand, real gross domestic product (RGDP), stock market development index(SMDI),bond market development index(BMDI) government expenditure (GEXP), real interest rate (RIR), inflation rate (INF), and foreign direct investment (FDI) are positively skewed implying that the majority of the values are less than their means. The minimal deviations of the variables from their means as indicated by the standard deviations demonstrate that taking the logs of variables minimizes their variances. In other words, the fluctuations are slow among these variables. To this end, the fact that the means are almost equal to the medians is an indication that the series are normally distributed.

Unit Roots Test Results

Once again, the bounds test (ARDL) approach to cointegration does not require the pretesting of the variables for unit roots, it is however important to perform this test to verify that the variables are not integrated of an order higher than one. The purpose is to ascertain the absence or otherwise of $I(2)$ variables to extricate the results from spurious regression. Thus, in order to ensure that some of the variables are not integrated at higher order, there is the need to complement the estimated process with unit roots tests.

For this reason, before applying Autoregressive Distributed Lags approach to cointegration and Granger-causality test, unit roots tests are

conducted in order to investigate the stationarity properties of the data. As a result, the ADF and PP tests were applied to all the variables in levels and in first difference in order to formally establish their order of integration. To be certain of the order of integration of the variables, the test was conducted with intercept and time trend in the model. The optimal number of lags included in the test was based on automatic selection by Schawrtz-Bayesian Criteria (SBC), Akaike Information Criteria (AIC), the $\overline{R^2}$ criteria or the Hannan and Quinn (H-Q) criteria. The study used the P-values in the parenthesis to make the unit root decision, (that is, rejection or acceptance of the null hypothesis that the series contain unit root) which arrived at similar conclusion with the critical values.

The results of ADF and PP test for unit roots with intercept and trend in the model for all the variables are again, presented in Table 13 and Table 14 respectively in Appendix B. The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of the null hypothesis is based on the MacKinnon (1996) critical values as well as the probability values.

Table 13 in Appendix B, presents the unit roots test results and the null hypothesis of the presence of unit roots for all the variables in their levels with the exception of real interest rate, log of gross fixed capital formation, inflation and log of trade openness cannot be rejected since the P-values of the ADF statistic are not statistically significant at any of three conventional levels of significance. However, at first difference, all the variables are stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected because the P-values of the ADF statistic are statistically significant at 1 percent significant levels for all the estimates.

The results of PP test for unit roots with only intercept in the model for all the variables are also presented in Table 14, Appendix B.

The unit roots test results in Table 14, Appendix B, show that the series are non-stationary at levels with the exception of log stock market development index, real interest rate, and log of gross fixed capital formation. This is because the P-values of the PP statistic are not statistically significant at any of the conventional levels of significance. However, at first difference, all the variables are stationary since the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant levels for all the series. It can be seen that the PP unit roots test results in Table 14, Appendix B, are in line with the results obtained from the ADF test in Table 13, Appendix B, suggesting that all the variables are integrated of order one, I (1) with the exception of log stock market development index, real interest rate, and log of gross fixed capital formation which are integrated of order zero, I (0), when only intercept is in the model.

Table 15 in Appendix B, presents the results obtained for ADF test for unit roots with both constant and trend in the model for all the variables.

From the unit roots test results in Table 15, Appendix B, it can be seen that all the variables are non-stationary at levels with the exception log stock market development index, real interest rate, and log of gross fixed capital formation. This is because the P-values of the ADF statistic are not statistically significant. However, when the variables are differenced for the first time they become stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant levels.

Table 16 in Appendix B, presents the unit roots test results obtained for the PP test with both intercept and trend in the model. From the unit roots test results in Table 16, the null hypothesis of the presence of the unit roots for all the variables in their levels with the exception log stock market development index, real interest rate, and log of gross fixed capital formation., cannot be rejected since the P-values of the PP statistic are not statistically significant at the conventional levels of significance (Table 16 in Appendix B). However, at first difference, all the variables are stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant level for all the variables. It is therefore clear from all the unit roots test results discussed above that all the variables apart from log of rainfall which is integrated of order zero, I(0), are integrated of order one I(1). Since the test results have confirmed the absence of I (2) variables, ARDL methodology is now used for the estimation.

The subsequent sections discuss the results of cointegration test results, long-run and short-run results as well as Granger causality test results.

Bounds Test for Cointegration

In the first step of the ARDL analysis, the presence of long-run relationships in equation (31) using equation (30) is tested. Given that the study employed quarterly data, a maximum lag length of 4 is used in the bounds test. Pesaran and Pesaran (1997) suggest a maximum lag length of 4 for quarterly data in the bounds testing approach to cointegration. After the lag length was determined, the F-test statistic computed within the bounds test framework is compared with the upper and lower critical values in Pesaran and Pesaran

(1997). The results of the bound test procedure for cointegration analysis between real gross domestic product and its determinant are presented in Table 17, Appendix B.

As show in Table 17, Appendix B, the joint null hypothesis of lagged level variables (that is, variable addition test) of the coefficients being zero (no cointegration) is rejected at 1 percent significance level. This is because the calculated F-statistic value of 8.6447 (F_{RGDP} (.)=8.6447) exceeds the upper bound critical value of 4.1000 at 99% level. This means there exists a long run relationship between real gross domestic product and banking sector development index.

The results in Table 17, Appendix B, indicate that there is a unique cointegration relationship among the variables in Ghana's economic growth model (equation 26) and that all the determinants of economic growth can be treated as the "long-run forcing" variables for the explanation of economic growth in Ghana. Since this aspect of the study is based on growth theory, $LRGDP_t$ is used as the dependent variable. Therefore, there is existence of cointegration relationship among the variables in the growth equation. The study therefore proceeds with the estimation of the parameters of the variables in the growth equation which begins with the long-run estimates and followed by the short-run estimates.

Long-run results (Economic growth is dependent variable)

Table 18 in Appendix B, shows the results of the long run estimates based on the Schwartz Bayesian criteria (SBC). The coefficients indicate the long run elasticities. Since economic growth and regressors are cointegrated, the long-run parameters of the ARDL model are estimated and the results are

presented in the Table 18, Appendix B.The long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC).

As shown in Table 18, Appendix B, all the estimated coefficients have their a priori expected signs. From the results, the coefficient of banking sector development is positive and statistically significant at 1 percent significance level, indicating that if the country were to increase banking sector development by 1 percent, then economic growth, measured as real gross domestic product will grow by approximately 0.46 percent. This means that development in the banking sector has the potential for stimulating economic growth in Ghana at the aggregate level over the study period. This is consistent with the findings by Hye and Wizarat (2011) where they established the effect of financial liberalisation on agricultural growth by employing Cobb-Douglas function in case of Pakistani economy, using ARDL bounds testing approach to cointegration. Their results showed that financial liberalisation has contributed to improve the performance of agricultural sector in the long run.

Further, the result is also confirmed by Sharif, Salehi, and Alipour (2009), where they investigated the relationship between financial market development and growth in agricultural sector in Iran. Their study attempted to empirically shed some light on the roles of financial development as well as other conditional variables in agricultural sector. The financial development and agricultural growth relationship is again confirmed by Parivash and Torkamani (2008),who assessed the effects of financial markets on growth of agriculture sector in case of Iran using VAR model and Granger causality tests. Their results showed that financial markets development has a positive impact on agriculture growth and hence overall growth of the economy.

The results are consistent with the findings in the empirical literature. Specifically, it concurs with the findings of Afangideh (2009) who investigated the effect of financial development on agriculture investment and agriculture output using three stage least squares (3SLS) approach in Nigeria. His results show that increase in bank lending improves the performance of agricultural sector by enhancing real gross national savings and real output. Empirical evidence suggested that a sound financial sector can alleviate growth financing constraints by enhancing savings, bank loans and improving investment activities in agriculture as well as agriculture sub-sectors which in effect, increase domestic output and hence economic growth.

In addition, consistent with expectation, the coefficient of government expenditure to real sector is positive in sign and is statistically significant at 1 percent significance level. The coefficient of government expenditure to the real sector indicates that a percentage point increase in the government expenditure in the productive sectors of the economy will lead to an increase in overall growth by approximately 0.16 percent in the long-run. Thus, government expenditure, as asserted by Keynesian theorists, has a positive effect on the growth of the Ghanaian economy over the study period.

This result is once again consistent with the findings by Benin, Mogues, Cudjoe, and Randriamamonjy (2009), who used district- and regional-level public expenditure data and household-level production data in Ghana. They estimated the agricultural productivity returns to different types of public expenditure across various agro-ecological zones of Ghana. The results revealed that provision of various public goods and services in the agricultural,

education, health and rural roads sectors have substantial impact on agricultural productivity and the economy as a whole.

They further stated that a one percent increase in public spending on agriculture is associated with a 0.15 percent increase in agricultural labor productivity, with a benefit-cost ratio of 16.8. Spending on feeder roads ranks second (with a benefit-cost ratio of 5), followed by health (about one hundredth of the value). The estimated marginal effects and returns differ for the four agro-ecological zones in Ghana.

The results of real interest rate, however, nullify the McKinnon-Shaw (MS) hypothesis. This is because real interest rate as measured by real deposit rate exerted negative impact on economic growth and is statistically significant at 1 percent significance level and the t-statistic value of 3.714 is quite high considering the rule of thumb value of two (2).Following McKinnon and Shaw (1973) and taking a neo-liberal stand, a liberalised interest rate spurs higher savings and this will then lead to an increased investment and ultimately growth. The implication of the result is that interest rate exhibits a very high response to equilibrium when shocked in the short-run The results, however, validate the argument of the Keynesian school of thought that interest rate should be negative because income effect dominates the positive substitution effect leading to a decrease in investment and ultimately a fall in output. The results concur with those by Ang and McKibbin (2005) for Malaysia and Arestis et al. (2001) for Greece, India and the Philippines. The results contradict the studies by Odhiambo (2009a) for Kenya.

Also, the coefficient of gross fixed capital formation or simply capital stock carried the expected positive sign and is statistically significant at 1

percent significance level. Thus, if Ghana increases her capital stock, which signifies investment by 1 percent, economic growth will increase by approximately 0.18 percent in the long-run (Table 18, Appendix B). Thus, capital stock is a positive determinant of growth in the Ghanaian economy. The results is in line with the findings of Ahmad and Qayyum (2008) which considered the role of private investment in agricultural growth in Pakistani economy and reported that investment contributes to economic growth by accelerating performance of agriculture sector. In fact, the role of investment in economic growth and development process of both advanced and developing economies have been recognised by economists since ages and the results of the current study are not exception.

Furthermore, the results show that the coefficient of inflation (INF) is negative and statistically significant at 5 percent significance level signalling a negative influence on economic growth. With a coefficient of -0.0013, it can be explained that a 1 percent increase in inflation leads to approximately 0.0013 percent decrease in economic growth measured by real gross domestic product. The impact on economic growth however is relatively minimal given the size of the coefficient. High rate of inflation affects the economy as well as the society significantly and adversely. Improper price regulation and imperfect information about aggregate price level causes inflationary situation in the economy. A high rate of inflation causes many economic problems like poverty, unequal distribution of wealth, market imperfections, deficit in balance of payments and unemployment as well as non-economic problems like social evils such as smuggling and hoarding *etc.* Inflation also disturbs the very important role of smoothness of price mechanism. Moreover, high inflation rate

has more volatility over time. The volatility of inflation rate is a hindrance for future economic planning and project evaluation and productive use of resources. High and unpredictable inflation slows down the process of economic growth and hurts the economy, Afzal, Malik, Butt, and Fatima (2013).

Stockman (1981) argued that individual's welfare falls whenever there is an increase in inflation. The negative effect of inflation on output is an indication that inflation causes economic growth in the long-run which is in tandem with the finding of Gylfason (1999) who finds a negative relationship between inflation and economic growth for low, middle and high income countries. Gylfason (1999) argued that higher rates of inflation leads to overvaluation of national currencies in real terms which affects the exchange rate and distorts production by driving a wedge between returns to real and financial capital and consequently reducing savings. This leads to lower returns to production and investments which invariably reduces economic performance. The finding is line with the findings of (Gokal & Hanif, 2004); Ahmed and Mortaza (2005); Samimi and Shahryar (2009); and Bittencourt (2012). Ahmed and Mortaza (2005) found a statistically significant long-run negative relationship between inflation and economic growth for Bangladesh. Gokal and Hanif, 2004) also found a statistically significant negative effect of inflation on output for Fiji. Bittencourt (2012) found out that inflation has a negative but significant effect on economic growth for four Latin American Countries (Argentina, Bolivia, Brazil and Peru).

The results however contradict the findings by Mallik and Chowdhury (2001), Khan and Ssnhadji (2001), Chimobi (2010) and (Erbaykal & Okuyan, 2008). Mallik and Chowdhury (2001) found a positive relationship between

inflation and output for four South Asian Countries (Bangladesh, India, Pakistan and Sri Lanka). Khan and Ssnhadji (2001) argued that inflation per se is not harmful to growth. Their study suggested that there is a threshold beyond which inflation is harmful to growth (i.e. inflation negatively affects economic growth). Additionally, to them when inflation is creeping it is not harmful to growth. Chimobi (2010) found no cointegrating relationship between inflation and output for Nigeria implying no long-run relationship between the two variables. Also, Erbaykal and Okuyan (2008) showed no statistically significant long-run relationship between inflation and output for Turkey.

Again, from the results, the coefficient of trade openness is statistically significant at 5 percent significance level, indicating that if the country were to increase her trade openness by 1 percent, economic growth measured as real gross domestic product will increase by approximately 0.16 percent in the long run using the new measurement of trade openness (Composite Trade Intensity (CTI)) by Squalli & Wilson (2006). The long run results obtained in this study do not absolutely resolve the conflicting results in the extant literature but contribute to the debate in the literature by aligning itself with those studies such as Nduka, Chukwu, and Nwakair (2013) and Ayibor (2012) which believe that trade openness positively affects real GDP. The new measurement of trade openness (CTI) proposed in the study found a positive relationship between trade openness and economic growth in the long run. This is consistent with theoretical expectation of the classical views on the role of trade in the macro economy. The positive trade openness-growth nexus is also consistent with other empirical studies such as Sachs & Warner (1995), Nduka et al., (2013),

and Hamad, Mtengwa, and Babiker., (2014) who found a positive impact of trade openness on economic growth.

According to economic theory trade induces economic growth by enhancing capital formation and efficiency, and by increasing the supply of scarce resources. For Ghana, the results obtained suggests that the trade openness policy adopted as part of the structural reforms in the 1986 in Ghana has helped open the economy and raised output. This emphasises the fact that trade openness enhances competition and efficiency as well as transfer of technology and knowledge and in effect, propels growth.

The results however contradict the findings of Ali and Abdullah (2015) in their study *'Impact of Trade Openness on the Economic Growth of Pakistan: 1980-2010'* and Githanga (2015) for Kenya. The findings by Ali and Abdullah (2015) showed a negative and statistically significant long-run relationship between trade openness and economic growth for Pakistan. Githanga (2015) on the other hand also found a negative and statistically significant long-run relationship between trade openness and economic growth for Kenya implying that trade openness is growth hampering in the long-run in Kenya. However, the coefficient and the statistical significance of trade openness indicate its moderate response to equilibrium when shocked in the short-run.

Furthermore, the coefficient of Foreign Direct Investment (FDI) carried the expected positive sign and is statistically significant at 5 percent significance level. Thus, if the country's FDI increases by 1 percentage point, real GDP will increase by approximately 0.05 percent in the long run. Given the t-value of approximately 2.6 against the rule of thumb t-value of 2, FDI exhibits relatively a quick return to equilibrium when disturbed in the short-run. The economic

rationale for offering special incentives to attract FDI frequently stems from the belief that foreign investment produces externalities in the form of technology transfers and spillovers. Romer (1993), for example, argues that there are important "idea gaps" between rich and poor countries. He notes that foreign investment can ease the transfer of technological and business know- how to poorer countries. These transfers may have substantial spillover effects for the entire economy and hence leading to economic growth. Rappaport (2000) observed that foreign direct investment boosts the productivity of all firms, and not just those receiving foreign capital.

Most macroeconomic studies that used aggregate FDI flows for a broad cross-section of countries, generally suggest a positive role for FDI in generating economic growth especially in particular environments (De Gregorio, 1992). For instance, Alfaro, Kalemli-Ozcan, and Sayek (2009) found that FDI promotes economic growth in economies with sufficiently developed financial markets. To add, Borensztein et al., (1998) argue that FDI has a positive growth-effect when the country has a highly educated workforce that allows it to exploit FDI spillovers. While Wang and Blomström (1992) find no evidence that education is critical; they argue that FDI has a positive growth-effect when the country is sufficiently rich. The result also supports most findings of empirical studies in the literature. Particularly, it agrees with studies by Dava (2012) who found a positive and significant effect of FDI on economic growth for a sample of seven Southern Africa Development Community (SADC) countries in his studies 'the effect of trade liberalisation on the growth of real GDP'.

The results however contradict the findings of Frimpong and Oteng-Abayie (2006) for Ghana, Atique, Ahmad, Azhar, and Khan (2004) for Pakistan and Falki (2009) too for Pakistan. These studies found a negative and statistically significant effect of FDI on economic growth. In the case of Ghana, Frimpong and Oteng-Abayie (2006) argued that most of the FDI inflows into the country go to the mining and construction sectors of the country. This however, does not generate direct growth impact on the economy as a whole and hence the negative effect.

The long-run results indicate that any disequilibrium in the system as a result of a shock can be corrected in the long-run by the error correction term. Hence, the error correction term that estimated the short-run adjustments to equilibrium is generated as follows:

$$ECM = LRGDP - 0.4174*LBSDI - 0.1449*LSMDI - 0.1200*LBMDI - 0.1585*LGEXP + 0.0075*RIR - 0.1751*LGFCF + 0.0013*INF - 0.1596*LTOPN - 0.0527*LFDI \quad (68)$$

Again, once the long-run cointegration model has been estimated, the next step is to model the short-run dynamic relationship among the variables within the ARDL framework. Thus, the lagged value of all level variables (a linear combination is denoted by the error-correction term, ECM_{t-1} is retained in the ARDL model.

Table 19 in Appendix B presents the results of the estimated error-correction model of real economic growth in Ghana using the ARDL technique. The model is selected based on the SBC. The results show the expected negative sign of error correction term lagged one period (ECM_{t-1}) and it is highly significant at 1 percent significance level. This confirms the existence of the

cointegration relationship among the variables with economic growth and various sub-sectors of financial sector development index as well as other control variables in the model yet again. The ECM stands for the rate of adjustment to restore equilibrium in the dynamic model following a disturbance or shock.

The coefficient of the lagged Error Correction Term, ECM (-1) is -0.7670. In other words, the statistically significant error correction term suggests that a deviation from the long-run equilibrium following a short-run disturbance or shock is corrected by about 77% at the end of each quarter in a year. According to Acheampong (2007), the rule of thumb is that, the larger the error correction coefficient (in absolute terms), the faster the variables equilibrate in the long-run when shocked in the short- run.

Table 19 results reveal that the past performances of the Ghanaian economy, in this case real gross domestic product, influence the current performance of the economy. In Table 19, Appendix B, D (LRGDP (-1)), D (LRGDP (-2)), and D (LRGDP (-3)), all have positive and statistically significant effects on the current growth performance (DLRGDP) in Ghana. This is expected in that previous growth and expansion of the economy serves as an indication of prosperity and may attract more investment leading to more growth.

The study also found that in the short-run, although banking sector development index D(LBSDI),as well as previous banking sector development index in the first quarter D(LBSDI(-1)), positively affect economic growth, but the effect was not statistically significant. However, it improves economic growth in the subsequent periods. For example, banking sector development

index in the previous second and third quarters significantly improved economic growth. That is, a 1 percentage point increase in the Ghanaian banking sector for example is likely to cause economic growth to increase by approximately 0.42 percent in the previous third quarter and is statistically significant at 1 percent level of significance.

Consistent with the long-run results, the coefficient of stock market development index D (LSMDI) has the theorised positive impact on economic growth in the short-run. The coefficient of D (LSMDI) is statistically significant at 5 percent significance level. From the results, a 1 percentage point increase in stock market development index will cause the real gross domestic product to grow by approximately 0.03 percent in the short-run. This indicates the crucial role stock market development plays in Ghana's economic growth process as its coefficient is positive in the dynamic model just as in the long run model. Further, in the short-run, stock market development index in the first, second, and third quarters also improve economic growth by approximately 0.07, 0.05, and 0.05 respectively, all at 1 percent level of significance.

Again, in the case of the bond market development, except the third quarter which has a negative effect on economic growth, there is a positive and statistically 1 percent level of significance effects on economic growth in all quarters in the short-run. For instance, when Ghana increases her bond market by 1 percentage point, real gross domestic product increases by approximately 0.05 percent in each quarter, except in the third quarter, when real gross domestic product decreases by 0.05 percent.

In addition, consistent with expectation, the coefficient of government expenditure to real sector is positive in sign and is statistically significant at 1

percent significance level in all quarters except the second quarter which is statistically significant at 5 percent significance level in the short-run. The coefficient of government expenditure to the real sector indicates that a 1 percentage point increase in the government expenditure in the productive sectors of the economy will lead to an increase in overall growth by approximately 0.39, 0.42, 0.21 and 0.24 percent respectively in the current, first, second and third quarters when shocked in the short-run. Thus, government expenditure, as asserted by Keynesian theorists, has a positively effect on the growth of the Ghanaian economy over the study period. As can be seen in Table 19, the lag of government expenditure {DLGEXP (-1)} has the expected a prior sign and has a significant influence on economic growth in the short run. Thus, with a positive value of 0.4206, it can be explained that a 1 percent increase in last quarter's government expenditure leads to approximately 0.42 percent increase in economic growth in the current quarter during the period under study. Its coefficient is statistically significant at 1 percent level of significance. Further, government expenditure lag 2 {DGEXP (-2)} also its expected positive a priori sign, however, and it is statistically significant. This means a percentage point increase in a last two quarter's government expenditure may lead to approximately 0.22 percent increase in economic growth in the current quarter since its coefficient is 0.2181. The results of government expenditure DLGEXP and the one lag of government expenditure {DGEXP(-1) are once again consistent with the findings by Benin et al., (2009),which used district- and regional-level public expenditure data and household-level production data in Ghana. They estimated the agricultural productivity returns to different types of public expenditure across various agro-

ecological zones of Ghana. The results revealed that provision of various public goods and services in the agricultural, education, health and rural roads sectors have substantial impact on agricultural productivity and the economy as a whole.

They further stated that a one percent increase in public spending on agriculture is associated with a 0.15 percent increase in agricultural labour productivity, with a benefit-cost ratio of 16.8. Spending on feeder roads ranks second (with a benefit-cost ratio of 5), followed by health (about one hundredth of the value). The estimated marginal effects and returns differ for the four agro-ecological zones in Ghana.

The short-run results of real interest rate again contravenes the McKinnon-Shaw (MS) predictions and in line with the long-run results. This is because real interest rate as measured by real deposit rate exerted negative impact on economic growth though statistically significant at 1 percent significance level in the current and first quarters but the t-statistic value of 6.0350 and 3.2985 respectively in absolute terms, are quite higher than the rule of thumb value of two (2). The findings, however, validate the argument of the Keynesian theoretical paradigm that negative income effect dominates the positive substitution effect leading to a decrease in investment and ultimately a fall in output. The results support those by Ang and McKibbin (2005) for Malaysia and Arestis et al. (2001) for Greece, India and the Philippines. It however, contradicts the studies by Odhiambo (2009) for Kenya. The magnitude of the coefficient implies that an increase in real interest rate by 1 percent will decrease real GDP by approximately 0.03 and 0.01 percent

respectively in the current and the first quarters if all other things remain constant.

Again, the coefficient of capital stock also maintained its positive sign and is statistically significant at 1 percent significance level in the current, second, and third quarters which is consistent with the long-run results. It is however, not statistically significant in the first quarter. The result therefore suggests that if capital stock increases by 1 percent, economic growth, proxied by real gross domestic product will increase by approximately 0.26,0.20, and 0.23 percent in the current, second, and third quarters respectively, in the short-run. Therefore, the short-run and long-run results indicate that capital stock positively impacts economic growth in Ghana.

Furthermore, consistent with findings of Khan and Qayyum (2007) and Githanga, (2015) for Kenya. This indicates the crucial role that capital stock plays in Ghana's growth process. The sign of capital stock variable supports the theoretical conclusion that capital contributes positively to growth of real GDP both in the short run and in the long run since the coefficients of capital stock, proxied by gross fixed capital formation have their expected positive signs and significant as well.

Again, the coefficient of inflation also maintained its negative sign and is statistically significant at 1 percent significance level which is consistent with the long run results. The result therefore suggests that if inflation goes up by 1 percent, economic growth will decrease by approximately 0.02 percent in the short run. Thus, the short run and long run results indicate that inflation has been a disincentive factor for economic growth effort in Ghana. The negative effect of inflation on economic growth seem more severe in the short run (-0.0162)

than in the long run (-0.0033). The results indicate how important it is to control inflation in the Ghanaian economy by putting in the appropriate policies. Its impacts in both the short- run and long-run appear to be debilitating as inflation generally proxy macroeconomic instability. In the empirical literature the results supports the findings by Ahmed and Mortaza (2005), Gokal and Hanif (2004), and Bittencourt (2010). Gylfason (1999) found evidence in support of a negative effect of on economic growth in the short run for countries that export primary commodities.

The result in this thesis or study is inconsistent with the findings by Asiedu, (2013) for Ghana who found a positive but insignificant effect of inflation on economic growth. The result also contradicts that of Mallik and Chowdhury (2001) who found a positive relationship between inflation and economic growth for South Asian Countries (Bangladesh, India, Pakistan and Sri Lanka).

Consistent with the long run results, the coefficient of trade openness has the theorised positive impact on economic growth in the short run. The coefficient of trade openness is statistically significant at 1 percent. From the results, the coefficient of trade openness is 0.7439, indicating that if the country were to increase her trade openness by 1 percent in the short run, economic growth measured as real gross domestic product will increase by approximately 0.74 percent using the new measurement of trade openness (Composite Trade Intensity (CTI)) suggested and used by Squalli and Wilson (2006). The results obtained in this study in the short run does not absolutely resolve the conflicting results in the extent literature but contribute to the controversy in the literature by aligning itself with those studies such as Dollar and Kraay (2003), Sarkar

(2008), Ali and Abdullah (2015) and Falki (2009) which believe that trade openness positively affects real GDP in the short run. The new measurement of trade openness (CTI) proposed in the study found a positive relationship between trade openness and economic growth in the short run.

This means that increases in trade openness (composite trade intensity) has the potential of stimulating economic growth in Ghana at the aggregate level over the study period in the short run. This is consistent with theoretical expectation of the classical views on the role of trade in the macro economy. In the empirical literature the results in the study is consistent with the findings by Ali and Abdullah (2015), Shaheen et al., (2013); Falki (2009); Khan and Qayyum (2007), Sarkar (2008), and Dollar & Kraay (2003) which found a positive and statistically significant effect of trade openness on economic growth in the short run.

According to economic theory trade induces economic growth by enhancing capital formation and efficiency, and by increasing the supply of scarce resources. For Ghana, the results obtained suggests that the trade openness policy adopted as part of the structural reforms in the 1986 in Ghana has helped open the economy and raised output in the short run. This emphasises the fact that trade openness enhances competition and efficiency as well as transfer of technology and knowledge and hence enhancing growth in the short run. This indicates the crucial role that trade openness plays in Ghana's growth process through the economic sector as its coefficient is positive in the dynamic model just as in the long run model.

However, the result contradicts the findings of Gries and Redlin (2012), Yucel (2009), and Rigobon and Rodrik (2005) who found a negative association

between economic growth and trade openness in the short run. Again, previous quarters' trade relations between Ghana and the rest of the world have also contributed positively to the current quarter's effects that trade openness has on economic growth and is statistically significant at the conventional levels.

From Table 19 in Appendix B, it can be observed that foreign direct investment D (FDI) exerts a positive influence on economic growth. Its coefficient of (0.2074) suggests that, a 1 percent increase in FDI leads to approximately 0.21 percent increase in economic growth at 1 percent level of significance. The positive effect of FDI reemphasises the fact that Ghana has benefited positively from the spillover effect of foreign investors in the country. The study is consistent with the work of Mello (1997). Mello (1997) argued that FDI influences economic growth by serving as an important source of capital, which complements domestic private investment in developing productive capacity. He further observed that FDI has the potential to generate employment and raise factor productivity via knowledge and skill transfers, adoption of new technology which helps local firms to improve their productive capacity thereby enhancing economic performance. To add, Lall (1985) argued that foreign investments come to host country with a package, including capital, technology, and management and marketing skills. They can, thus, improve competition, efficiency; provide additional jobs and financial resources in an economy and hence leading to robust economic performance.

The finding however contradicts the findings of Asiedu, (2013); Frimpong and Oteng, (2006) for Ghana and Falki (2009) in the case of Pakistan. These studies found a negative and statistically significant effect of FDI on economic growth in the short run. In the case of Ghana, Asiedu (2013) argued

that most of the FDI inflows into the country go to the mining and construction sectors of the country. This however, does not generate direct growth impact on the economy as a whole and hence the negative effect observed in the short run.

The R-Square reveals that approximately 84 percent of the variations in economic growth are explained by the regressors in the model. It can further be seen that the R-Square value 0.8387 is less than the Durbin DW-statistic value of 2.0210 indicating that the results are robust and not spurious.

Model Diagnostic Tests

Diagnostic tests were once again conducted for the ARDL model. The tests as reported in Table 20 in Appendix B, indicate that the estimated model passes the Langrangean multiplier test of residual serial correlation among variables. Also, the estimated model passes the tests for Functional Form Misspecification or RESET test using square of the fitted values. The model also passed the Normality test based on the Skewness and Kurtosis of the residuals. Thus, the residuals are normally distributed across observations. Finally, the estimated model passes the test for heteroscedasticity test based on the regression of squared residuals on squared fitted values.

Stability Tests

When analyzing the stability of the coefficients, the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQ) are applied. Following Pesaran and Pesaran (1997) and vindicated by Bahmani-Oskooee, & Nasir (2004) the stability of the regression coefficients is evaluated by stability tests and the tests can determine whether or not the parameter estimates are stable

over time. This stability test is appropriate in time series data, especially when one is uncertain about when structural change might have taken place. The results for CUSUM and CUSUMQ are shown in Figure 14 and Figure 15. The null hypothesis is that the coefficient vector is the same in every period and the alternative hypothesis is that the coefficient vector is not the same in every period, Bahmani-Oskooee & Nasir (2004). The CUSUM and CUSUMQ statistics are plotted against the critical bound of 5 percent significance level. According to Bahmani-Oskooee & Nasir. (2004), if the plot of these statistics remains within the critical bound of the 5 percent significance level, the null hypothesis that all coefficients are stable cannot be rejected.

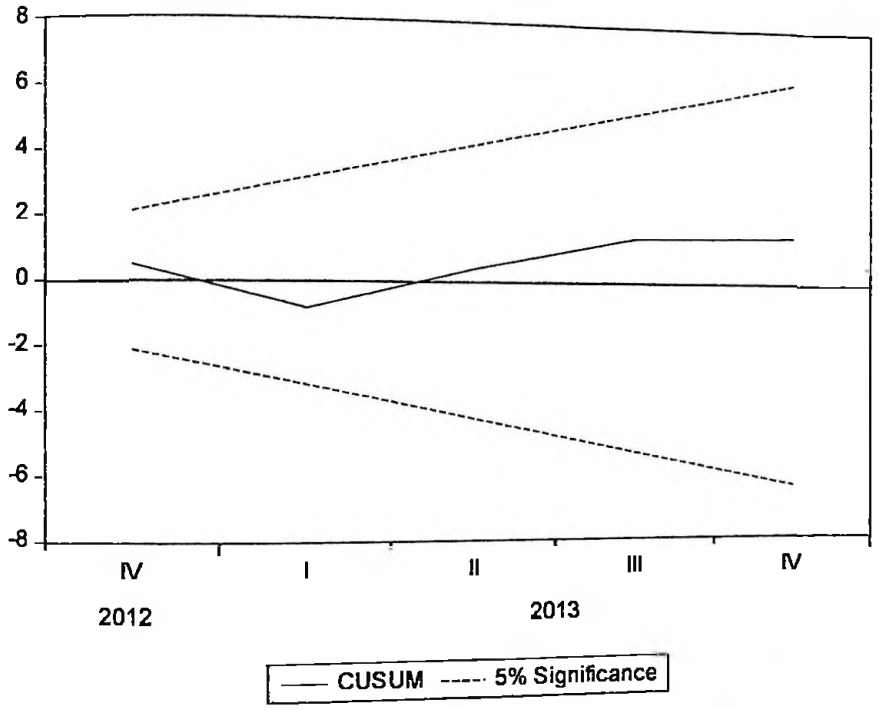

Figure 15: Plot of Cumulative Sum of Recursive Residuals

Note: The variable on the vertical axis is residuals whiles the horizontal axis is years in quarters.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

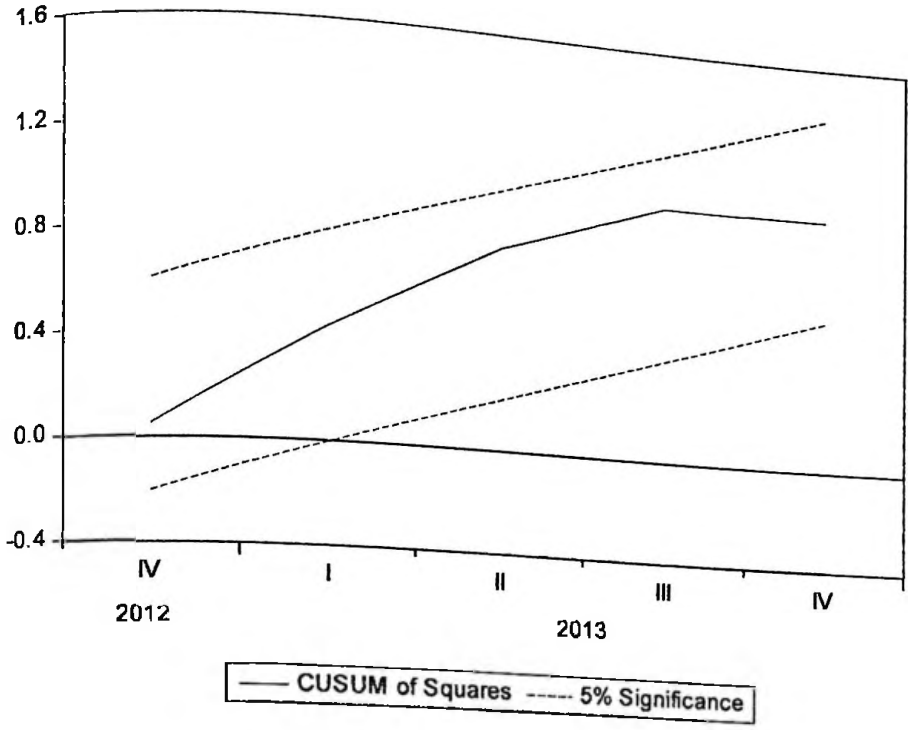

Figure 16: Plot of Cumulative Sum of Squares of Recursive Residual

Note: The variable on the vertical axis is the square of the residuals whiles the variable on the horizontal axis is years in quarters.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

As shown in Figures 15 and 16, the plot of both the *CUSUM* and *CUSUMSQ* residuals are within the 5 percent critical bound (boundaries). That is to say that the stability of the parameters has remained within its critical bounds of parameter stability. It is clear from both graphs in Figures 14 and 15 that both the *CUSUM* and *CUSUMQ* tests confirm the stability of coefficients of the financial development functions.

Granger Causality Test

In order to examine the predictive power of banking sector development on economic growth, Granger Causality test was applied to measure the linear causation among the variables. Employing the Pairwise Granger Causality test

attributed to Engel and Granger (1987), the following results were obtained as depicted in Table 21, Appendix B. In testing for causality between variables, the following outcomes can be expected: a test concludes that a variable Granger causes the other when the set of coefficients for the two variables are statistically significant.

Thus, causality can be assumed to move from one variable to the other. On the other hand, a test concludes that a variable does not Granger cause the other, when the set of coefficients of the variables are not statistically significant. Table 21 in Appendix B reports the results for the Granger causality between the variable of interest in the study. From the Table 21, the null hypothesis that log of banking sector development index (LBSDI) does not Granger cause log of economic growth (LRGDP) is rejected at 1 percent significance level meaning that the lag values or histories of banking sector development together with that of real gross domestic product, which is a proxy for economic growth, help in explaining or predicting variations in economic growth, than it can using only lag values or histories of economic growth. However, the other way round Granger causality is not rejected at any of the conventional levels of significance implying that the lag values of economic growth together with the lag values of banking sector development index do not predict variations in banking sector development.

The results suggest unidirectional causality from banking sector development to economic growth and there is no feedback response. The endogenous growth literature predicts bidirectional causality between economic growth and banking sector development. They argued that the financial sector contributes to economic growth through its effects on the volume of investment

and efficiency of investment by: collecting and analysing costly information on entrepreneurs/investment projects; allocating credit to its highest productive use; enabling technological advancement; transforming the composition of savings to suit investment and financing of human capital formation. Similarly, economic growth, according demand-following theorists is expected to influence development of the financial sector by creating the demand for financial services, thereby enabling the creation of new financial products and deepening of the financial system. In the empirical literature, the result is in consonance with the findings of Demetriades and Hussein (1996a), Luintel and Khan (1999), Abu-Bader and Abu-Qarn (2008a) and Lu et al., (2007).

This finding is, however, consistent with the supply-leading but inconsistent with the demand-pulling hypothesis already discussed. In the empirical literature, the results contradict the findings of Adam and Siaw (2010) and Quartey and Prah (2008) in the case of Ghana. Adam and Siaw (2010) found evidence for the demand pulling hypothesis with causality running from economic growth to financial deepening when financial deepening is proxied by credit to private sector. The findings of Quartey and Prah (2008) revealed support for demand-following hypothesis, when growth of broad money to GDP ratio was used as a measure of financial development. However, when growth in domestic credit to GDP ratio, private credit to GDP ratio, and private credit to domestic credit ratio were used as proxies for financial development, they found support for the 'independent' hypothesis.

Also, the null hypothesis that stock market development index (SMDI) does not Granger cause RGDP is rejected at 1 percent significance level, however, there is no feedback response. In other words, there is unidirectional

causality between SMDL and RGDP with causality running from SMDI to RGDP which vindicates the MS hypothesis. The result means that the lag values or histories of SMDI together with that of RGDP, which is a proxy for economic growth, help in explaining or predicting variations in economic growth, than it can using only lag values or histories of economic growth. However, the other way round Granger causality is not rejected at any of the conventional levels of significance implying that the lag values of economic growth together with the lag values 0f SMDI do not predict variations in SMDI.

Further, the results in Table 21, Appendix B, reveal that the null hypothesis that bond market development index (BMDI) does not Granger cause RGDP is rejected at 1 percent significance level, however, there is no feedback response. In other words, there is unidirectional causality between BMDL and RGDP with causality running from BMDI to RGDP which vindicates the MS hypothesis. The result means that the lag values or histories of BMDI together with that of RGDP, which is a proxy for economic growth, help in explaining or predicting variations in economic growth, than it can using only lag values or histories of economic growth. However, the other way round Granger causality is not rejected at any of the conventional levels of significance implying that the lag values of economic growth together with the lag values 0f MDI do not predict variations in BMDI. It can therefore be concerted that the financial sector development which in this thesis constitutes: BSDI, SMDI, and BMDI, Granger causes RGDP through McKinnon Conduit effect and the causality is unidirectional.

In addition, the result supports the null hypothesis that log of government expenditure (LGEXP) does not granger cause log of real gross

domestic product (LRGDP), a proxy for economic growth, which is not expected, especially by Keynesian theorists, on the other hand the result rejects the null hypothesis that log of real gross domestic product does not granger cause log of government expenditure at1 percent significant level. This implies that the lag values of economic growth together with that of government expenditure predict variations in government expenditure. Thus, there is a unidirectional causality from economic growth to government expenditure.

Again, the results show that real interest rate Granger causes economic growth at 5 percent level of significance. However, the null hypothesis that economic growth does not granger cause interest rate is not rejected. This means that the past values of economic growth together with the past values of real interest rate cannot predict variations in interest rate. In other words, there is unidirectional causality between economic growth and real interest rate with causality running from interest rate to economic growth. As expected, the interest rate liberalisation which was key in Ghana's financial sector reforms in 1988, has led to banking sector development and hence economic growth, (Acheampong, 2007; Bawumia & Owusu 2008; and Bawumia, 2010).

Similarly, the results indicate unidirectional causality between gross fixed capital formation and economic growth at 5 percent significance level with causality running from gross fixed capital formation to economic growth while the null hypothesis economic growth does not Granger Cause gross fixed capital formation is not rejected at any of the conventional significance levels. It is important to note, however that causality from investment to growth is stronger than the causality from growth to investment. This is in line with the long-run findings. It also gives credence to the fact that investment in productive capital

is a real boaster for every economy including that of the Ghanaian economy. Nevertheless, growth in the economy also creates income for reinvestment.

In fact, empirically the results revealed from the study give credence to the findings of Adhikary (2011) for Bangladesh who found a unidirectional causality between capital stock and economic growth running from capital to economic growth.

However, the study contradicts the results obtained by Ayibor (2012) which found bidirectional causality between capital stock (gross fixed capital formation) and economic growth for Ghana. It also contradicts the results obtained by Kanu and Ozurumba (2014) for Nigeria. Kanu and Ozurumba (2014) identified a unidirectional causality between gross fixed capital formation (a proxy for capital stock) and economic growth running from economic growth to capital stock and not the other way round.

Again, the Granger causality test results in Table 21 reveal that the null hypothesis that inflation does not granger cause economic growth is rejected at 1 percent significance level, implying that inflation Granger causes economic growth However, the null hypothesis that economic growth does not granger cause inflation cannot be rejected, meaning that economic growth does not Granger cause inflation since the resulting coefficient from the test is not statistically significant, implying that the lag values of economic growth together with that of inflation do not predicts variations in inflation. Thus, a unidirectional causality established running from inflation to economic growth at 1 percent significance level.

The unidirectional causality between inflation and economic growth is in consonance with the results of Andinuur (2013) for Ghana, Chimobi (2010)

for Nigeria and Erbaykal and Okuyan (2008) for Turkey. Andinuur (2013) found a unidirectional causality between inflation and economic growth running from inflation to economic growth. Chimobi (2010) identified a unidirectional causality between inflation and economic growth running from inflation to economic growth. Erbaykal and Okuyan (2008) found a unidirectional causality between inflation and economic growth running from inflation to economic growth.

Further, the results indicate that the null hypothesis that trade openness does not Granger cause economic growth is rejected at 1 percent significance level meaning that the lag values or histories of trade openness together with that of real GDP or economic growth explain and predict variations in economic growth, than it can using only lag values of economic growth. However, there is no reverse response. that is the null hypothesis that RGDP does not Granger cause TOPN is not rejected, implying that the lag values of economic growth together with the lag values of trade openness do not predict variations in trade openness. The results suggest unidirectional causality from trade openness to economic growth. The results obtained in the study on causality does not absolutely resolve the conflicting results in the extent literature but contribute to the controversy in the literature by aligning itself with those studies such as Olufemi (2004), and Nath and Mamun (2004) who established a unidirectional causality running from trade openness to growth.

The result, however, contradicts with the study conducted by Arif and Ahmad (2012) who examined the causal effects between trade openness and economic growth for Pakistan. Their results found a bidirectional significant relationship between trade openness and economic growth. Also, the results

concur studies done by (Nduka et al., 2013). In the case of Nduka et al., (2013) their empirical findings clearly suggested that economic growth causes trade openness in the case of Nigeria and there is no feedback response. To them, there was a unidirectional causality running from economic growth to trade openness.

Moreover, the results in Table 21, Appendix B, show a rejection of the null hypothesis that LFDI does not Granger cause LRGDP at 1 percent significance level. However, the null hypothesis that real gross domestic product (economic growth) does not granger cause foreign direct investment is not rejected implying that the lag values of economic growth together with that of FDI do not predict variations in foreign direct investment (FDI). Thus, there is a unidirectional causality from foreign direct investment to economic growth.

This finding of the study or thesis is in line with the findings of Esso (2010) who re-examined the relationship between FDI and economic growth in the case of Sub- Saharan Africa countries. The study suggests that, foreign direct investment significantly causes economic growth in three countries, while the growth causes foreign direct investment in two countries. The study is in consonance with the findings of Ayibor (2012) who found a unidirectional causality relationship between FDI and economic growth in Ghana. The results also support the findings of Zhang (2001), who in exploring the existence of bi-directional causation between foreign direct investment and economic growth for a sample of eleven Latin American and East Asian countries for a 30-year period found that there is unidirectional causality for five countries running from FDI to economic growth.

The study however, contradicts the study done by Andinuur (2013) who examined the causal effects between FDI and economic growth for Ghana. His results found bidirectional causality between FDI and economic growth in Ghana. The results also contradict the study of Muhammad Adnan Hye (2011) who examined the causal relation between FDI and economic growth for Liberia. Also, the result is inconsistent with the studies done by Chowdhury & Mavrotas (2006). In the case of Chowdhury and Mavrotas (2006) their empirical findings clearly suggested that economic growth causes FDI in the case of Chile and not vice versa, while for both Malaysia and Thailand, there is strong evidence of a bidirectional causality between the two variables. The result in this study, again, contradicts the study done by Irandoust (2001) who examined the causal effects between FDI and output growth for four OECD countries. Their results found no causal relationship between FDI and output growth in Denmark and Finland.

Chapter Summary

The main focus of this chapter was once again the estimation of the ARDL model and the presentation and obviously discussion of its results. The chapter began with presentation of the descriptive statistics, and then proceeded with the tests for unit roots in the series by employing both the ADF and PP techniques. The unit roots tests were conducted in levels and in first difference with intercept only, and intercept with trend.

The unit roots tests results involving both ADF and PP techniques revealed that all the variables in the model were integrated of either order zero [I(0)] or order one [I(1)] which justified the application of ARDL Bound test

fixed capital formation, trade openness and foreign direct investment on economic growth. Real interest rate and inflation however, exerted a negative and statistically significant effect on economic growth.

The short run estimates also provide evidence of statistically significance and positive effect of financial sector development on economic growth. Thus, short run growth in the financial sector leads to an increase in economic growth. Government expenditure and its lags, gross fixed capital formation and its lags, trade openness and its lags as well as foreign direct investment and its lags maintained the expected signs and exerted a positive and statistically significant effect on economic growth in the short run. With the exception of real interest rate and inflation, albeit exhibited expected sign, exerted a negative and statistically significant effect on economic growth. Finally, the model passed the parameter stability tests of serial correlation, functional form misspecification, non-normal errors, heteroscedasticity, CUSUM and CUSUMSQ. The study, in conclusion found a unidirectional causality between trade openness and economic growth running from trade openness to economic growth.

CHAPTER SEVEN

ANALYSIS OF THE EFFECTS OF FINANCIAL DEVELOPMENT ON POVERTY REDUCTION

Introduction

This chapter presents the estimation results and the analysis of the effects of financial development on poverty reduction in Ghana. The chapter begins with a look at the basic descriptive statistics of the two main variables: financial sector development index (FSDI) and the poverty reduction (POV), as well as other control variables which affect poverty reduction. Further, unit roots tests results involving Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests follow. Here, tests with constant only and tests with constant and trend of both ADF and PP are also presented.

Further, Bounds Test for Cointegration results and the short - run and the long - run results of the main variables of interest, and using Autoregressive Distributed Lag (ARDL) approach to cointegration are presented and discussed as well as the results of Granger Causality tests. The chapter also dealt with post estimation tests and the stability tests. These results are discussed in relation to the hypotheses of the study.

Table 22: Descriptive Statistics of the Variables

	POV	FSDI	RGDP	INF	TOPEN	GEXP	GFCF
Mean	161.3004	41929.12	4.46E+09	4.831901	19.44955	3.198427	5.72008
Median	91.52334	38372.43	2.01E+09	3.806319	19.24787	2.963354	5.625507
Maximum	1082.162	141228.1	1.23E+10	15.57559	30.02538	5.293115	7.904292
Minimum	18.88684	327.4967	1.16E+09	2.128068	10.49827	2.258884	2.921219
Std. Dev.	155.5685	30882.91	3.66E+09	3.051293	4.600269	0.71907	1.005172
Skewness	3.715167	1.050804	0.796105	1.91142	0.163255	1.13036	-0.27437
Kurtosis	20.10882	4.060134	2.050817	6.378117	2.608274	3.639846	3.48355
Jarque-Bera	1449.673	23.08601	14.31701	108.4407	1.083573	23.00109	2.228878
Probability	0.0000	0.00001	0.000778	0.0000	0.581708	0.00001	0.328099
Sum	16130.04	4192912	4.46E+11	483.1901	1944.955	319.8427	572.008
SumSq.Dev.	2395955	9.44E+10	1.33E+21	921.7283	2095.085	51.18909	100.0267
Observations	100	100	100	100	100	100	100

Note: Std. Dev. represents Standard Deviation while Sum Sq. Dev. represents Sum of Squared Deviation.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

The study computed the descriptive statistics of the relevant variables involved in the study. From Table 22, the variables have positive average values (means). It can also be seen from Table 22 that, poverty reduction (POV), financial sector development index (FSDI), real gross domestic product (RGDP), inflation rate (INF), trade openness (TOPN), and government expenditure (GEXP) are positively skewed, implying that majority of their values are less than their means, however, gross fixed capital formation (GFCF) is negatively skewed, which means that majority of its values are greater than its mean. The minimal deviations of the variables from their means as indicated by the standard deviations demonstrate that when logs of the variables are taken, it minimises their variances. In other words, the fluctuations are slow among these variables. Again, since the means are almost equal to their medians is an indication that the series are normally distributed

Unit Roots Test Results

Albeit, the bounds test (ARDL) approach to cointegration does not require the pretesting of the variables for unit roots, it is however important to perform this test to verify that the variables are not integrated of an order higher than one. The purpose is to ascertain the absence or otherwise of $I(2)$ variables to extricate the results from spurious regression. Thus, in order to ensure that some of the variables are not integrated at higher order, there is the need to complement the estimation process with unit roots tests.

For this reason, before applying Autoregressive Distributed Lags approach to cointegration and Granger-causality test, unit roots tests was conducted in order to investigate the stationarity properties of the data. As a

result, all the variables were examined by first inspecting their trends graphically. Additionally, the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests were applied to all the variables in levels and in first difference in order to formally establish their order of integration. To be certain of the order of integration of the variables, the test was conducted first, with constant and no time trend, and second, with constant and time trend in the model. The optimal number of lags included in the test was based on automatic selection by Schawrtz-Bayesian Criteria (SBC), Akaike Information Criteria (AIC), the $\overline{R^2}$ criteria or the Hannan and Quinn (H-Q) criteria. The study used the P-values in the parenthesis to make the unit roots decision, (that is, rejection or acceptance of the null hypothesis that the series contain unit root) which arrived at similar conclusion with the critical values.

The results of ADF and PP tests for unit roots with constant (intercept) only in the model for all the variables are presented in Table 23 and Table 24 respectively in Appendix C. The null hypothesis is that the series is non-stationary, or contains a unit roots. The rejection of the null hypothesis is based on the MacKinnon (1996) critical values as well as the probability values.

From the unit roots test results Table 23 in Appendix C, the null hypothesis of the presence of unit roots for all the variables in their levels with the exception of log of real gross domestic product, log of trade openness, and log of government expenditure, are rejected since the P-values of the ADF statistic are statistically significant at the three conventional levels of significance. However, at first difference, the rest of the variables become stationary. This is because the null hypothesis of the presence of unit roots (non-

However, when the variables are differenced for the first time they become stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant levels.

Table 26 in Appendix C presents the unit roots test results obtained for the PP test with both constant and trend in the model. Table 26 in Appendix C reveals the PP Unit Roots Test results with constant and trend; the null hypothesis of the presence of the unit roots for all the variables in their levels with the exception of log of poverty reduction, log of financial sector development index, and log of gross fixed capital formation which are rejected at 1, 5 and 10 significance levels respectively since the P-values of the PP statistic are not statistically significant at the conventional levels of significance. However, at first difference, all the variables are stationary. This is because the null hypothesis of the presence of unit roots (non-stationary) is rejected at 1 percent significant level for all the variables. It is therefore clear from all the unit roots tests results discussed above that all the variables apart from log of poverty, log of financial sector development index and log of gross fixed capital formation which are integrated of order zero, I(0), are integrated of order one I(1). Since the test results have confirmed the absence of I (2) variables, ARDL methodology is now used for the estimation of long -run and short-run parameters.

To this end the subsequent sections again discuss the results of cointegration test results, long-run and short-run results as well as Granger causality test results.

Bounds Test for Cointegration

In the first step of the ARDL analysis, the presence of long-run relationships in equation (42) is tested. Given that the study employed quarterly data, a maximum lag length of 4 is used in the bounds test. Pesaran and Pesaran (1997) suggest a maximum lag length of 4 for quarterly data in the bounds testing approach to cointegration. After the lag length was determined, the F-test statistic computed within the bounds test framework is compared with the upper and lower critical values in Pesaran and Pesaran (1997). The results of the bound test procedure for cointegration analysis between poverty reduction and its predictors are presented in Table 27, Appendix C.

As show in Table 27, Appendix C, the joint null hypothesis of lagged level variables (that is, variable addition test) of the coefficients being zero (no cointegration) is rejected at 1 percent significance level. This is because the calculated F-statistic value of 8.918337 ($F_{LPOV}(.)$=8.918337) exceeds the upper bound critical value of 4.43 at 99% level. This means there exists a long run relationship between poverty reduction and financial sector development index.

The results indicate that there is a unique cointegration relationship among the variables in Ghana's poverty reduction model (equation 26) and that all the determinants of poverty reduction can be treated as the "long-run forcing" variables for the explanation of poverty reduction in Ghana. Since this study is based on liberal theory, $LPOV_t$ is used as the dependent variable.

Further, having established the existence of long-run relationship between poverty reduction and its determinants, the ARDL cointegration method is then used to estimate long-run parameters of equation ( ).

Long-run results (POV) is the dependent variable)

Since poverty reduction and financial sector development index are cointegrated, the long-run parameters of the ARDL model are estimated and the results are presented in the Table 28, Appendix C. The long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC). The coefficients indicate the long run elasticities.

Once poverty reduction and financial sector development index as well as other controlled variables are cointegrated, the long-run parameters of the ARDL model are estimated and the results are presented in the Table 28, Appendix C. The long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC).

To begin with Table 28 in Appendix C, all the estimated coefficients have their a priori expected signs. From the results, the coefficient of financial sector development index is negative and statistically significant at 1 percent significance level. This indicates that if Ghana were to increase financial sector development by 1 percent, then household final consumption expenditure per capita will decrease by approximately 0.28 percent and hence poverty reduction. This means that growth in the financial sector has the potential in reducing poverty in Ghana over the study period. The effects of financial sector development on poverty reduction can be direct or indirect. The direct effects of final sector development on poverty reduction emanate from the fact that development in the financial sector results in direct access to financial services by the poor as financial institutions become more efficient and willing to extend credit to the poor (individuals) which will ultimately improve the lives of the poor. This is because there will be a fall in information asymmetry, lower

transaction cost, minimisation and diversification of risk, and finally access to credit by the poor to smoothing consumption in all forms as well as other expenditure, and also investment in productive and high yielding projects. On the other hand, the indirect effects of growth in the financial sector on poverty reduction stems from the fact that financial development affects economic growth positively and this in turn affects poverty (i.e. trickle-down effect).Therefore, it can be said that the financial liberalisation effort in 1988 which was part of the overall Economic Recovery and Structural Adjustment Programmes in 1983 was a right economic decision but suffered implementation problems.

The results in Table 28, Appendix C, concur with Quartey (2008) which primarily investigated the interrelationship between financial sector development and poverty reduction in Ghana. This was done using time-series data from the World Development Indicators from 1970-2001. The main findings of his studies were, first, that even though financial sector development does not Granger-cause savings mobilisation in Ghana, it induces poverty reduction; and second, that savings do Granger-cause poverty reduction in Ghana. Also, the effect of financial sector development on poverty reduction is positive but insignificant. This is due to the fact that financial intermediaries in Ghana have not adequately channelled savings to the pro-poor sectors of the economy because of government deficit financing, high default rate, lack of collateral and lack of proper business proposals. Another interesting finding of his study was that there was a long-run cointegration relationship between financial sector development and poverty reduction. Albeit, Quartey (2008) and the current study have similar conclusions, they however differ in terms of the

level of significance, This is because the long-run results of the current study between financial sector development and poverty reduction is also positive but statistically significant over the study period.

Again, real gross domestic product, a proxy for economic growth maintained its expected sign. This is because holding all other variables in the model constant, growth in the real sectors of the Ghanaian economy will have positive effect on poverty reduction. From the results in Table 28, Appendix C, a 1 percentage point increase in real gross domestic product will lead to approximately 0.86 percent in poverty reduction. It is argued that a country with an increased and efficient financial system is likely to extend credit to the productive sectors of the economy in order to finance the projects with highest return. In other words, increased and efficient volume of investment as a result of financial development results in higher growth which in turn positively affects poverty reduction, (Acheampong, 2007).

Further, higher rate of inflation has been negatively linked to the lower standard of living or poor economic conditions of individuals, firms, as well as governments (economic agents). The results in Table28 indicate that the long-run coefficient of inflation has the expected sign and is statistically significant at 5 percent significance level. Specifically, an increase in inflation by 1 percent will induce approximately 0.052 percent increase in poverty levels over the study period in the long-run. This result is consistent with theory in that higher rate of inflation tends to reduce the real money balances and saving potential of the consumer. The implication is that, inflation coerces the poor individual to higher transaction cost and thus cannot consume adequately with his or her fixed

income. On the contrary, the rich are unaffected significantly by increases in inflation rate unlike their poor counterparts.

According to Afzal, Malik, Butt, & Fatima (2013), a high rate of inflation causes many economic problems like poverty, unequal distribution of wealth, market imperfections, deficit in balance of payments and unemployment as well as non-economic problems like social evils such as smuggling and hoarding etc. Inflation also disturbs the very important role of smoothness of price mechanism. Moreover, high inflation rate has more volatility over time. The volatility of inflation rate is a hindrance for future economic planning and project evaluation as well as productive use of resources. High and unpredictable inflation slows down the process of economic growth and hurts the economy and ultimately increases poverty.

To this end, the long-run coefficient of trade openness has its theoretical expected negative sign and is statistically significant at 5 percent significance level as shown in the Table 28, Appendix C. The coefficient of (-0189) indicates that trade openness has the potential of reducing poverty levels in Ghana. Specifically, if Ghana increases her trade openness by 1 percentage point, this will cause approximately 0.019 percent reduction in poverty .The result, once again has proven that the trade liberalisation policy in 1986 which was adopted as part of the overall Economic Recovery and Structural Adjustment Programmes which began November, 1983 has contributed to poverty reduction in Ghana.

Again, the role of government in reducing poverty as measured by government expenditure has the expected sign. This means that government expenditure is crucial in reducing poverty in Ghana. The results reveal that a 1

percent increase in government expenditure will lead to approximately 1.04 percent in poverty reduction in the long-run over the study period.

Finally, gross fixed capital formation, according to the long-run results in Table 28, Appendix C, is negative and statistically significant at 10 percent significance level. The results indicate that a 1 percentage point increase in gross fixed capital formation, leads to approximately 0.10 percent reduction in poverty.

The long-run results in Table 28, Appendix, C indicate that any disequilibrium in the system as a result of a shock can be corrected in the long-run by the error correction term. Hence, the error correction term that estimated the short-run adjustments to equilibrium is generated as follows:

$$ECM = LPOV + 0.2761*LFSDI + 0.8571*LRGDP - 0.0515*INF + 0.0189*T0PEN + 1.0363*LGEXP + 0.1022*GFCF \quad (69)$$

Short-run results (POV is the dependent variable)

Once the long-run cointegration model has been estimated, the next step is to model the short-run dynamic relationship among the variables within the ARDL framework. Thus, the lagged value of all level variables (a linear combination is denoted by the error-correction term, ECM_{t-1} is retained in the ARDL model.

Table 29 in Appendix C presents the results of the estimated error-correction model of financial development in Ghana using the ARDL technique. The model is selected based on the SBC. The results show the expected negative sign of error correction term lagged one period (ECM_{t-1}) and it is highly significant at 1 percent significance level. This confirms the existence of the

cointegration relationship among the variables (poverty reduction and financial sector development) in the model yet again. The ECM stands for the rate of adjustment to restore equilibrium in the dynamic model following a disturbance or shock.

The coefficient of the lagged Error Correction Term, ECM (-1) is -0.3393 In other words, the statistically significant error correction term suggests that a deviation from the long-run equilibrium following a short-run disturbance or shock is corrected by about 34 percent at the end of each quarter in a year. Thus, the speed of adjustment to long-run equilibrium following a shock in the short-run in each quarter during the study period is about 34 %. According to Acheampong (2007), the rule of thumb is that, the larger the error correction coefficient (in absolute terms), the faster the variables equilibrate in the long-run when shocked in the short- run.

The results from the ARDL model as displayed in Table 29 reports that individuals past history in terms of poverty levels affect his or her current living standard .The effect of previous values of poverty reduction lag one, D(LPOV(-1)) and lag two, D(LPOV(-2)) are not statistically significant at any of the conventional levels of significance. In other words, previous values of poverty reduction lag one and two statistically do not influence the current value of poverty reduction in the short-run. However, poverty reduction lag three, D (LPOV (-3)) has the expected negative sign and statistically significant at 1 percent significance level in the short-run. This means that improvement in the third quarter's poverty level by 1 percent leads to approximately 0.28 percent reduction in poverty levels in Ghana. The implication is that current value of poverty is affected by previous quarters' values of poverty reduction in Ghana.

Again and consistent with the long-run results, the coefficient of financial sector development index is negative and statistically significant at 1 percent significance level, indicating that if the country were to increase financial development by 1 percent, then poverty levels will improve by approximately 0.11 percent in the short-run. This is evident by the studies done by Chemli, (2014); Zahonogo, (2016); Quartey, (2005) which highlighted the influence of financial development on poverty reduction. Further, it can therefore be said that the financial sector reforms embarked on 1988 as part of the Economic Recovery and Structural Adjustment Programmes have had tremendous impact on poverty reduction in Ghana over the study period and this is once again confirmed by the short-run outcomes.

Again, in line with the long-run results, real gross domestic product, a proxy for economic growth maintained its expected sign in the short-run. Specifically, the coefficient of real gross domestic product is statistically significant at 1 percent level of significance. The implication is that if Ghana increases her real gross domestic product in the short-run by 1 percent, this will cause poverty to reduce by approximately 0.62 percent. This is because holding all other variables in the model constant, growth in the real sectors of the Ghanaian economy will have positive effect on poverty reduction. It is argued that a country with an increased and efficient financial system is likely to extend credit to the productive sectors of the economy in order to finance the projects with highest return. In other words, increased and efficient volume of investment as a result of financial development results in higher growth which in turn positively affects poverty reduction, (Acheampong, 2007).

Further, the coefficient of inflation maintained its theorised expected sign in the shot-run and consistent with the long-run results. Inflation has been negatively linked to the lower standard of living or poor economic conditions of individuals, firms, as well as governments. The results in Table 29, Appendix C, indicate that the short-run coefficient of inflation is statistically significant at 1 percent significance level. Specifically, an increase in inflation rate by 1 percent will induce approximately 0.08 percent increase in poverty levels over the study period in the short-run. This result is consistent with theory in that higher rate of inflation tends to reduce the real money balances and saving potential of the consumer. The implication is that, inflation coerces the poor individual to higher transaction cost and thus cannot consume adequately with his or her fixed income. On the contrary, the rich are unaffected significantly by increases in inflation rate unlike their poor counterparts.

The result concurs with Afzal, Malik, Butt, & Fatima (2013), which established that a high rate of inflation causes many economic problems like poverty, unequal distribution of wealth, market imperfections, deficit in balance of payments and unemployment as well as non-economic problems like social evils such as smuggling and hoarding etc. Inflation also disturbs the very important role of smoothness of price mechanism. Moreover, high inflation rate has more volatility over time. The volatility of inflation rate is a hindrance for future economic planning and project evaluation as well as productive use of resources. High and unpredictable inflation slows down the process of economic growth and hurts the economy and ultimately increases poverty.

The short-run coefficient of trade openness has its theoretical expected negative sign and is statistically significant at 1 percent significance level as

shown in the Table 29. The coefficient of (-0.0528) indicates that trade openness has the potential of reducing poverty levels in Ghana. Specifically, if Ghana increases her trade openness by 1 percentage point, this will cause approximately 0.053 percent reduction in poverty in the short-run. The result, once again is in line with that of long-run results. The trade liberalisation policy in 1986 which was adopted as part of the overall Economic Recovery and Structural Adjustment Programmes which began November, 1983 has contributed to poverty reduction in Ghana.

Further, the crucial role of government in reducing poverty in Ghana cannot be overemphasised and this is reflected in the short-run results as well as the long-run results in the Table 29, Appendix C. The current coefficient of government expenditure has its expected negative sign and is statistically significant at 1 percent level of significance. Thus, a 1 percentage point increase in government's expenditure will result in improving poverty levels in Ghana by approximately by 0.33 percent in the short-run. Just as the case in the long-run, government expenditure or spending can be financed by government borrowing (domestic or international), seigniorage, or taxes. Changes in government spending are a major component of fiscal policy used to achieve macroeconomic stability. In reducing poverty, the role of government can be in the provision of housing, potable water, health intervention and health facilities, and education. Skills training and job creation have also been identified as part of the strategies in alleviating poverty.

To this end, for fiscal policy, increases in government expenditure or spending are expansionary, while decreases are contractionary. John Maynard Keynes was one of the first economists to advocate government deficit spending

(increased government spending financed by borrowing) as part of the fiscal policy response to an economic contraction. According to Keynesian economics, increase in government spending raises aggregate demand and increases consumption, which leads to increased production and faster recovery from recessions. Classical economists, on the other hand, believe that increased government spending exacerbates an economic contraction by shifting resources from the private sector, which they consider productive, to the public sector, which they consider unproductive. In addition, government expenditure lag one, D (LGEXP (-1)), and lag two, D (LGEXP (-2)) show their effects on the current government expenditure in reducing poverty in Ghana. Specifically, government expenditure lag one, thus D (LGEXP (-1)), has a negative coefficient and statistically significant at 5 percent significance level. Again, this means that if government increases its expenditure by 1 percent, this will result in reducing poverty by approximately 0.34 percent.

Further, the R-Square shows that approximately 74 percent of the variations in financial sector development are explained by the regressors in the model. It can be seen that the R-Square value 0.9430 is less than the Durbin DW-statistic value of 1.9571 indicating that the results are not spurious.

Model Diagnostic Tests

Diagnostic tests were conducted for the ARDL model. The tests as reported in Table 30, Appendix C, indicate that the estimated model passes the Langrangean multiplier test of residual serial correlation among variables. Also, the estimated model passes the tests for Functional Form Misspecification or RESET test using square of the fitted values. The model also passed the

Normality test based on the Skewness and Kurtosis of the residuals. Thus, the residuals are normally distributed across observations. Finally, the estimated model passes the test for heteroscedasticity test based on the regression of squared residuals on squared fitted values.

Stability Tests

When analyzing the stability of the coefficients, the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQ) are applied. Following Pesaran and Pesaran (1997) and vindicated by Bahmani-Oskooee, & Nasir (2004) the stability of the regression coefficients is evaluated by stability tests and the tests can determine whether or not the parameter estimates are stable over time. This stability test is appropriate in time series data, especially when one is uncertain about when structural change might have taken place. The results for CUSUM and CUSUMQ are shown in Figure 16 and Figure 17. The null hypothesis is that the coefficient vector is the same in every period and the alternative hypothesis is that the coefficient vector is not the same in every period, Bahmani-Oskooee & Nasir (2004). The CUSUM and CUSUMQ statistics are plotted against the critical bound of 5 percent significance level. According to Bahmani-Oskooee & Nasir (2004), if the plot of these statistics remains within the critical bound of the 5 percent significance level, the null hypothesis that all coefficients are stable cannot be rejected.

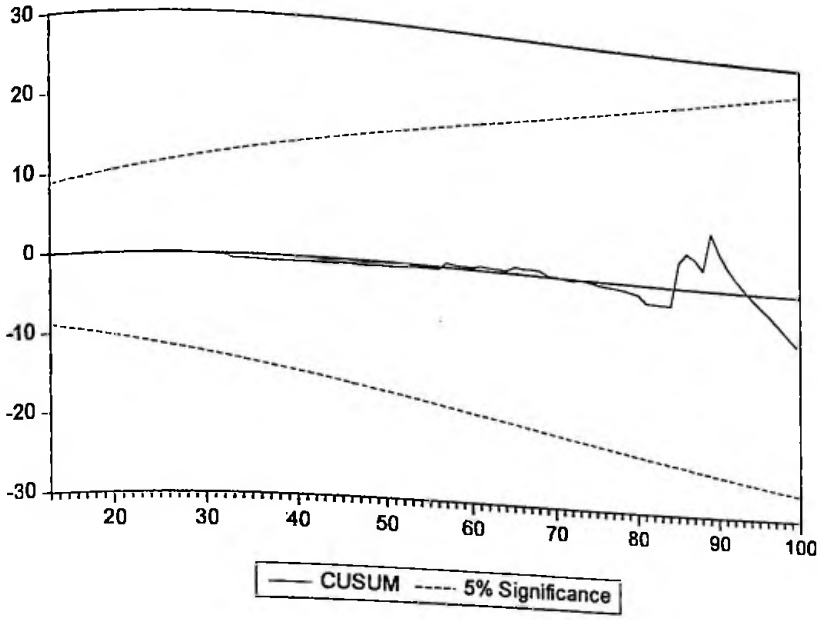

Figure 17: Plot of Cumulative Sum of Recursive Residuals

Note: The variable on the vertical axis is residuals whiles the variable on the horizontal axis is years in quarters.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

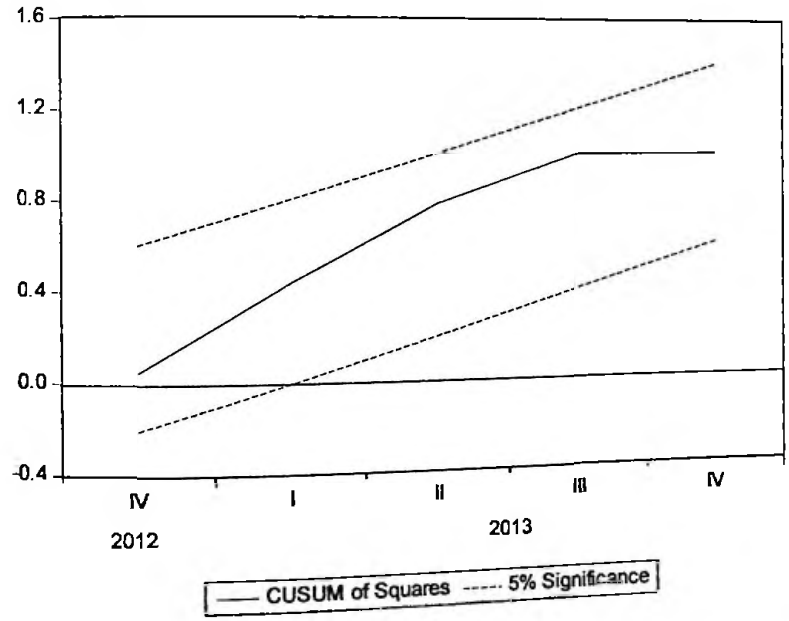

Figure 18: Plot of Cumulative Sum of Squares of Recursive Residual

Note: The variable on the vertical axis is the square of the residuals whiles the variable on the horizontal axis is years in quarters.

Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

As shown in Figures 17 and 18, the plot of both the CUSUM and CUSUMSQ residuals are within the 5 percent critical bound (boundaries). That is to say that the stability of the parameters has remained within its critical bounds of parameter stability. It is clear from both graphs in Figures 16 and 17 that both the CUSUM and CUSUMQ tests confirm the stability of coefficients of the financial development functions.

Granger Causality Test

In order to examine the predictive power of financial openness on financial sector development index, Granger Causality test was applied to measure the linear causation among the variables. Employing the Pairwise granger causality test attributed to Engel and Granger (1987), the following results were obtained as depicted in Table 31, Appendix C. In testing for causality between variables, the following outcomes can be expected: a test concludes that a variable Granger causes the other when the set of coefficients for the two variables are statistically significant.

Thus, causality can be assumed to move from one variable to the other. On the other hand, a test concludes that a variable does not Granger cause the other, when the set of coefficients of the variables are not statistically significant. Table 31 in Appendix C reports the results for the Granger causality between the variable of interest in the study. From Table 31 in Appendix C, the null hypothesis that log of financial sector development index (LFSDI) does not Granger cause log of poverty reduction (LPOV) is rejected at 1 percent significance level meaning that the lag values or histories of financial sector

development index together with that of real household final consumption per capita, which is a proxy for poverty reduction, help in explaining or predicting variations in poverty reduction,, than it can using only lag values or histories of poverty reduction,. However, the other way round Granger causality is not rejected at any of the conventional significance levels implying that the lag values of poverty reduction together with the lag values of financial sector development index do not predict variations in financial sector development index. The results suggest unidirectional causality from financial sector development index to poverty reduction. This implies that there is no reverse relationship between financial sector development index and poverty reduction. The implication is that financial sector development predicts poverty reduction but poverty reduction does not predict financial sector development.

The endogenous growth literature predicts a bi-directional causality between economic growth and banking sector development. They argued that the financial sector contributes to economic growth through its effects on the volume of investment and efficiency of investment by: collecting and analysing costly information on entrepreneurs/investment projects; allocating credit to its highest productive use; enabling technological advancement; transforming the composition of savings to suit investment and financing of human capital formation which will ultimately spur poverty reduction. Similarly, economic growth also influences development of the financial sector by creating the demand for financial services, thereby enabling the creation of new financial products and deepening of the financial system. In this case, the financial sector can then extend credit to the poor at least cost to enable the poor smoothen consumption. In the empirical literature, the result is in consonance with the

findings of Demetriades and Hussein (1996), Luintel and Khan (1999), Abu-Bader and Abu-Qarn (2008), and Lu et al. (2006).

This finding is, however, inconsistent with both the supply leading and demand pulling hypothesis already discussed. In the empirical literature, the results contradict the findings of (Adam & Siaw, 2010; Quartey & Prah, 2008) in the case of Ghana. Adam and Siaw (2010) found evidence for the demand pulling hypothesis with causality running from economic growth to financial deepening when financial deepening is proxied by credit to private sector. The findings of Quartey and Prah (2008) revealed support for demand-following hypothesis, when growth of broad money to GDP ratio was used as a measure of financial development. However, when growth in domestic credit to GDP ratio, private credit to GDP ratio, and private credit to domestic credit ratio were used as proxies for financial development, they found support for the 'independent' hypothesis.

Again, the results from Table 31in Appendix C reveal that log of real gross domestic product, (LRGDP), a proxy for economic growth Granger causes log of poverty reduction (LPOV) which is proxied by household final consumption expenditure per capita (also known as private per capita consumption) at 1 percent significance level while log of poverty reduction does not Granger cause log of real gross domestic product. The implication is that lag values or histories of log of real gross domestic product together with that of household final consumption expenditure per capita, which is a proxy for poverty reduction, help in explaining or predicting variations in poverty reduction,, than it can using only lag values or histories of log of poverty reduction at 1 percent significance level. In other words, causality runs from

economic growth to poverty reduction and there is no feedback response from poverty reduction to economic growth, hence indicating a unidirectional causality. These results give credence to both the long-run and short-run results that economic growth impacts poverty reduction positively.

Further, Table 31 in Appendix C reports that inflation, (INF) Granger causes log of poverty reduction at 1 percent significance level while log of poverty reduction, (LPOV) does not Granger cause inflation. This means that lag values or histories of inflation together with that of household final consumption expenditure per capita, which is a proxy for poverty reduction, help in explaining or predicting variations in poverty reduction, than it can using only lag values or histories of log of poverty reduction at 1 percent significance level. In other words, causality runs from inflation to poverty reduction and there is no reverse causation from poverty reduction to inflation, hence indicating a unidirectional causality. These results give credence to both the long-run and short-run results that inflation is detrimental to the Ghanaian economy and therefore affects the well-being of individuals negatively.

In addition, the results show that the null hypothesis that log of trade openness, (LTOPN) does not Granger cause log of poverty reduction, LPOV is rejected at 5 percent level of significance while there is no reverse causation from log of poverty reduction to log of trade openness. This means that there is enough evidence that the null hypothesis that LTOPEN does not Granger cause LPOV is not true at 5 percent level of significance. Hence, there is unidirectional causality running from LTOPEN to LPOV and the results vindicate the conclusions of both the short-run and long-run results that trade openness negatively affects poverty reduction.

Moreover, the results obtained from Table 31 in Appendix C show clearly that log of government expenditure (LGEXP), Granger causes log of poverty reduction (LPOV) at 1 percent significance level while there is no feedback response from poverty reduction to government expenditure. This means that lag values of log of government expenditure together with that of household final consumption expenditure per capita, which is a proxy for poverty reduction, help in explaining or predicting variations in poverty reduction,, than it can using only lag values of log of poverty reduction at 1 percent significance level. Again, unidirectional causality relationship is established between government expenditure and poverty reduction with causality running from government expenditure to poverty reduction. The results lend support for the Keynesian theorists who advocate for high government expenditure in the wake of economic downturn. However, the results concur with the short-run and long-run results that government expenditure spurs poverty reduction.

Finally, results in Table 31, Appendix C, reveal that gross fixed capital formation, (LGFCF) Granger causes poverty reduction (LPOV) at 5 percent significance level while the reverse causation that LPOV does not Granger causes LGFCF is validated. This means unidirectional causality runs from LGFCF to LPOV is vindicated and the results give credence to the short-run and long-run.

Chapter Summary

The main focus of this chapter was the estimation of the ARDL model and the presentation and obviously discussion of its results with particular

reference to an analysis of the effects of financial sector development on poverty reduction in Ghana .The chapter began with presentation of the descriptive statistics, then proceeds with the tests for unit roots in the series by employing both the ADF and PP techniques. The unit roots tests were conducted in levels and in first difference with intercept only, and intercept with trend.

The unit roots tests results involving both ADF and PP techniques revealed that all the variables in the model were integrated of either order zero [I(0)] or order one [I(1)] which justified the application of ARDL Bound test technique for parameter estimates. Specifically, with ADF and PP tests with intercept or constant only, LPOV, LFSDI, and LDFCF were stationary at levels whereas LRGDP, INF, LTOPN, and LGEXP were not stationary at levels. However, when the non-stationary variables were differenced once, the variables became stationary. The study concluded that LPOV, LFSDI, and LDFCF are integrated of order zero [I (0)], while LRGDP, INF, LTOPN, and LGEXP are integrated of order one [I (1)]. All the variables were transformed into natural logarithm except INF. The study further tested for the existence of a cointegration relationships among the variables.

The results of the ARDL (4, 0, 1, 0, 1, 3, 0,) model selected based on SBC indicate that the error correction term (ECM_{t-1}) for poverty reduction carried the expected negative sign. Also, the results imply that the variables play a significant role in influencing poverty reduction in Ghana.

The long run results revealed a negative and statistically significant effect of financial sector development index on poverty reduction. This implied an inverse relationship between the two variables. The study also found a negative and statistically significant effect of real gross domestic product, trade

openness, government expenditure, and gross fixed capital formation (capital stock).Inflation however exerted a positive and statistically significant effect on poverty reduction.

The short run estimates also provide evidence of negative and statistically significance effect of financial sector development index on poverty reduction. Thus, in short run changes in financial sector development index leads to poverty reduction. Real gross domestic product, trade openness, government expenditure, and gross fixed capital formation (capital stock) exhibited the expected signs and exerted negative and statistically significant effects on poverty reduction in the short run. Government expenditure and its lags as well as lags of poverty reduction exhibited the expected signs and exerted a negative and statistically significant effect on poverty reduction in the short run. With exception of inflation, albeit exhibited expected sign exerted a positive and statistically significant effect on poverty reduction. Finally, the model passed the parameter stability tests of serial correlation, functional form misspecification, non-normal errors, heteroscedasticity, CUSUM and CUSUMSQ. The study, in conclusion found a unidirectional causality between poverty reduction and financial sector development index with causality running from financial sector development index to poverty reduction.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The previous three chapters have revealed and confirmed that financial openness; together with other control variables affect financial sector development in Ghana. Again, financial sector development in turn impacts positively on the real sectors of the Ghanaian economy when other factors are controlled for, through what has been known as McKinnon Conduit Effect. Financial development directly affects economic growth and indirectly (i.e. via economic growth) spurs poverty reduction in the Ghanaian context.

To this end, the current chapter presents the summary, conclusions and recommendations of the study. Whereas the summary presents a brief overview of the research problem, objectives, methodology and findings, the conclusions capture the overall outcomes regarding the findings of the study in the light of the hypotheses. The chapter further provides policy recommendations as well as the limitations and direction for future research.

Summary of the Study

This study investigated the effects of financial openness on financial development as well as the effects of financial development on economic growth and whether or not this has resulted in poverty reduction in Ghana using quarterly time series data from 1990:1 to 2015:4. The relevance of understanding the macroeconomic determinants of financial development lies in the fact that a deeper and more active financial sector is of crucial importance for key economic variables (that is, economic growth and poverty reduction).

The study specifically examined the long-run and short-run determinants or drivers of financial development, economic growth and poverty reduction in Ghana. It employed the Autoregressive Distributed Lag (ARDL) approach to cointegration to examine the long-run and short-run dynamics among the variables used in the estimation. Finally, the study examined the causal relationship between financial openness and financial development and the other variables in the first empirical model, between financial development and economic growth and other variables in the second empirical model and between financial development and poverty reduction as well as other variables, using the pair-wise Granger-causality test. The variables used in the study included: financial sector development index, financial openness, economic growth, poverty reduction, trade openness, inflation rate, real interest rate, government expenditure, gross fixed capital formation, foreign direct investment, banking sector development index, stock market development index, bond market development index All tests and estimations were conducted using E-views 9.0 package and Stata 13 package was used for the construction of index variables.

The first step in estimation process involved testing for the stationarity properties of the variables using both the Augmented-Dickey Fuller (ADF) and Phillips-Perron test statistics. The unit roots results suggest that all the variables were stationary after taking the first difference. The study then proceeded to examine the long-run and short-run relationships between financial development and its determinants, economic growth and financial development as well as other control variables and poverty and other control variables.

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The following are therefore the findings of the study:

- The cointegration analyses revealed the presence of long-run relationships among financial sector development index, financial openness, economic growth, poverty reduction, trade openness, inflation rate, real interest rate, government expenditure, gross fixed capital formation, foreign direct investment, banking sector development index, stock market development index, bond market development index
- The error correction models also revealed a short run relationships among financial sector development index, financial openness, economic growth, poverty reduction, trade openness, inflation rate, real interest rate, government expenditure, gross fixed capital formation, foreign direct investment, banking sector development index, stock market development index, and bond market development index.
- Results in the short-run were consistent with the results in the long-run. The positive and negative effects of all the variables on financial development were more severe in the long-run than in the short-run. The results of the Granger-causality tests suggested a unidirectional causality between financial openness and financial development; between financial development and economic growth, and between financial development and poverty reduction.
- The first empirical evidence from the ARDL results shows that financial openness, trade openness, real gross domestic product, and government expenditure exhibited a positive effect on financial development in both the long-run and the short-run. However, real interest rate and inflation rate exhibited a negative effect on financial development in both

periods. The existence of a long-run relationship among financial development, financial openness, trade openness, real gross domestic product, real interest rate, inflation and government expenditure was further confirmed by the negative and statistically significant coefficient of the lagged error correction term. The value of this coefficient suggests that about 65 percent of the disequilibrium caused by previous quarters' shocks in the short-run converges back to the long-run equilibrium in the current quarter in each year. Statistically, any disequilibrium in the financial sector takes about four months, fifteen days to restore to equilibrium.

- Again, the second empirical evidence from the ARDL results shows that financial sector development which is represented by banking sector, stock market and bond market, together with government expenditure, gross fixed capita formation, trade openness, and foreign direct investment exhibited a positive and significant effect on real gross domestic product in both the long-run and the short-run. However, real interest rate and inflation rate exhibited a negative and significant effect on real gross domestic product in the short-run as well as long-run. The existence of a long-run relationship among economic growth, financial development, government expenditure, real interest rate, gross fixed capital formation, inflation, trade openness, and foreign direct investment was further confirmed by the negative and statistically significant coefficient of the lagged error correction term. The value of this coefficient suggests that about 77 percent of the disequilibrium caused by previous quarters' shocks in the short-run converges back to

periods. The existence of a long-run relationship among financial development, financial openness, trade openness, real gross domestic product, real interest rate, inflation and government expenditure was further confirmed by the negative and statistically significant coefficient of the lagged error correction term. The value of this coefficient suggests that about 65 percent of the disequilibrium caused by previous quarters' shocks in the short-run converges back to the long-run equilibrium in the current quarter in each year. Statistically, any disequilibrium in the financial sector takes about four months, fifteen days to restore to equilibrium.

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sum of squares of recursive residuals (CUSUMSQ) show that there is stability of the parameters.

Conclusions

The recent global financial crisis and its concomitant repercussions on the economies of both the advanced and the developing world has once again ignited interest into the role of finance in the process of economic growth and development and its consequential effects on poverty reduction .Therefore, investigating the determinants of financial development and the channels of effecting economic growth and poverty reduction has become a subject of great concern for researchers. The reason for this is the increasing evidence that indicates that financial development leads to economic growth and hence poverty reduction. The finance-growth nexus has captured the interest of development practitioners, finance experts, and researchers as well as policy makers in recent times given the turbulent experiences of the financial world and its accompanying consequences. The study therefore investigated the determinants of financial development with particular emphasis on financial openness factor, and how financial development in turn impacts economic growth and poverty reduction in Ghana. The following are the conclusions derived from the study:

- The study in accordance with the empirical literature has shown that there exists long-run and the short-run relationships among financial development, financial openness, economic growth ,poverty reduction, trade openness, government expenditure, gross fixed capital formation, real interest rate, inflation, and foreign direct investment.

- Specifically, the results presented in this study reveal that financial openness, trade openness, economic growth, and government expenditure are positive and statistically significant determinants of financial development but real interest rate and inflation have a negative and statistically significant effects on financial development both in the long-run and in the short-run.
- Again, the study has established that financial development (banking sector development, stock market development bond market development) government expenditure, gross fixed capital formation, trade openness, and foreign direct investment exerted positive and statistically significant effects on economic growth in the short-run and long-run. However, real interest rate and inflation shown negative and statistically significant effects on economic growth in the long-run and the short-run.
- Related to the above is that the effect of banking sector development on economic growth is more severe than stock market development, followed by bond market development. This is observed in terms of their respective coefficients.
- Further, the long-run and short-run tests results indicate that financial sector development, real gross domestic product, a proxy for economic growth, trade openness, government expenditure, and gross fixed capital formation exerted negative and statistically significant effects on poverty reduction. Meaning these variables contribute to poverty reduction. However, inflation has a positive and statistically significant

effect on poverty reduction. In other words, inflation worsens the plight of the poor.

- Moreover, the study found a unidirectional causality between financial development and financial openness with causality running from financial openness to financial development
- In addition the study found a unidirectional causality between financial development and economic growth with the causality running from financial development to economic growth.
- Also, the study revealed unidirectional causality between financial development and poverty reduction with causality running from financial development to poverty reduction

Recommendations

Following the findings from the study, the following recommendations are proposed.

Albeit, Ghana's financial sector is to some extent liberalised, there is always a room for improvement, therefore Central Bank of Ghana's monetary policy should not only be directed at achieving price stability but also improving the financial openness of the financial sector. This can be achieved if the Government of Ghana observes the independence of the Central Bank.

Again, liberalisation of the financial sector alone may not achieve the needed objectives of the economy, therefore, Government of Ghana through the Ministry of Trade should fashion out trade policies and programmes, for example trade fairs at local and international levels and encourage free flow of

goods and movement of people in order to boost Ghana's trade competitiveness. In this regard, Ministry of Trade should encourage producers and exporters to add value to the primary products before exporting them becomes crucial.

Moreover the findings of the study revealed that real gross domestic product, a proxy for economic growth positively impact financial development and this is an evidence of how important it is to maintain high GDP growth in the Ghanaian economy. Thus, to ensure development in the financial sector, the government needs to first ensure that there is growth in the economy by maintaining macroeconomic stability.

Another policy implication of the study is that the Central Bank of Ghana must ensure low inflationary rate in the Ghanaian economy. This can be achieved through appropriate monetary policy implementation by the Monetary Policy Committee of the Central Bank. Proper management of inflation by the Central Bank is a requirement for attaining macroeconomic stability because inflation does not only raise the transaction cost of business but also undermine the wellbeing of the citizenry. Related to this is that individuals are discouraged from savings during high rate of inflation and this affects intermediary role of financial institutions.

Further, financial institutions in Ghana need to also consider reducing their interest rate to attract borrowing from the private sector so as to boost development in the financial sector of the economy.

In addition, the findings from the study showed that the role of government expenditure in form of provision of infrastructure (education, health, roads, and potable water), payment of salaries of government's employees, law and contract enforcement, and institutional quality foster

financial sector development, economic growth and ultimately poverty reduction. This is evident in the positive and statistically significant effects of government expenditure on financial sector development, economic growth and poverty reduction both in the long-run and the short-run results. Therefore, Government of Ghana must ensure effective and efficient use of its financial resources.

Again, even though the findings indicate that the effects of banking sector development on economic growth is more severe than those of the stock market and the bond market, however, these sub-sectors of the financial sector are complementary, as indicated by their positive coefficients. As such, the Central Bank of Ghana must encourage growth in all the sub-sectors of the financial sector at the same time.

Finally, the findings from this study revealed that foreign direct investment has a positive and statistically significant effect on economic growth and economic growth in turn spurs poverty reduction. Therefore, on one hand, Government of Ghana through the judiciary must ensure law and contract enforcement and on the other hand, Central Bank of Ghana must ensure achievement of macroeconomic stability. These together will provide the needed business environment to attract more foreign direct investment.

Contributions to Knowledge

This thesis contributes to literature on financial development, economic growth, and the poverty reduction nexus by aligning itself to supply – leading hypothesis of McKinnon- Shaw and endogenous growth theory. This is evident

by the short run and the long run test results as well as Granger Causality test results.

Again, in terms of methodology, the study uses Principal Component Analysis (PCA) to construct an index for financial sector development involving nine indicators or measures of financial sector development which has not been the case in the literature on financial development, economic growth, and the poverty reduction nexus in Ghana. Financial development is a process that involves the interaction of many activities and institutions and therefore should not be measured by one or two indicators as has been the case in the literature. The PCA index results confirm the positive and statistically significant effects of financial development on economic growth and poverty reduction in Ghana.

In terms of policy, the study revealed the complementary role by the various sub-sectors of financial sector in Ghana. By disaggregating financial sector of Ghana into banking sector development, stock market development, and bond market development in a single study the effects of each subsector of Ghana's financial sector established and can be assessed. Therefore the study recommends that all the various sectors of Ghana's financial sector should be developed simultaneously.

Limitations of the Study

The main limitation of the study has to do with the limited availability of quarterly data on key variables that reflect on various markets and institutions as well as dimensions of financial development such as access, depth, stability, efficiency and the level of openness or liberalisation of financial development

.To produce highly reliable estimates especially with cointegration, variables that have their values already in quarters were needed. As a result, quarterly series were generated through interpolation using Gandolfo (1981) statistical algorithm for the purpose of the estimation. However, there is no gain in the power of these tests by switching from low frequency to high frequency data and merely increasing the number of observations. Also, the data for some of the variables were either missing or not up to date. Hence, period average growth rate of such variables were employed to generate missing ones and this might have affected the quality of some results. According to Acheampong, (2007) and Osei, (2005) the use of interpolated quarterly series did not however, pose any danger to the quality and reliability of the results because other authors have employed similar approach and have arrived at reliable results. In all, these limitations could not have affected the general outcome and conclusions of the study significantly.

Direction for Future Research

The study sets out to investigate the financial openness and financial development nexus, financial development and economic growth nexus, and financial development and poverty reduction nexus in Ghana, in which case both the long-run and short-run relationships were established as well as the direction of causality However, financial development involves the interaction of many activities and institutions. Moreover, financial development could also be looked at in terms of market based (stock market, bond market and derivative market) and bank based as well as insurance industry.

Again, financial development entails many dimensions such as: access, depth, stability, efficiency and the level of openness or liberalisation of the financial sector and therefore, a study involving financial development is expected to satisfy these requirements. For these reasons, a PCA was used to construct an index for financial sector development which included nine measures or indicators of financial development with the view of satisfying these requirements. However, due to data inadequacy, these requirements could not be satisfied fully. Consequently, future research could consider using many more measures of financial development in order to satisfy the requirements for various markets and institutions.as well as the dimensions of financial sector development for both cointegration and Granger causality tests in addition to using different econometric techniques and long span of annual data.

Finally, determinants of financial development, economic growth, and poverty reduction vary from macroeconomic factors, legal and institutional factors, geographical factors, monetary and fiscal factors, and political factors. This therefore means that future researchers could explore the other factors that affect financial development, economic growth, and poverty reduction other than those considered in this study.

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APPENDICES

APPENDIX A

RESULTS OF THE EFFECTS OF FINANCIAL OPENNESS ON FINANCIAL DEVELOPMENT

Unit Roots Test Results

Table 3: Results of Unit Roots Test with constant only: ADF Test

Levels			First Difference			
Variables	ADF-Statistics	Lag	Variables	ADF-Statistics	Lag	*I(0)*
LFSDI	-3.2855[0.0747]*	2				I(0)
FO	-3.2418[0.0825]*	2				I(0)
LTOPN	-2.5233[0.3165]	2	ΔLTOPN	-5.4417 [0.0001] ***	1	I(1)
LRGDP	-2.1905[0.4892]	2	ΔLRGDP	-5.0158[0.0004]***	1	I(1)
RIR	-4.8051[0.0009]***	2				I(0)
INF	-3.5062[0.0442]**	2				I(0)
LGEXP	-2.9471[0.1527]	1	ΔLGEXP	-5.4236[0.0001]***	1	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 4: Results of Unit Roots Test with constant only: PP Test

Levels			First Difference			
Variables	PP-Statistics	BW	Variables	ADF-Statistics	BW	*I(0)*
LFSDI	-3.6920 [0.0275]**	4				I(0)
FO	-2.5208 [0.3177]	5	ΔFO	-5.2584[0.0002]***	4	I(0)
LTOPN	-2.1060[0.5358]	4	ΔLTOPN	-5.6522[0.0000]***	3	I(1)
LRGDP	-1.8773[0.6588]	4	ΔLRGDP	-5.2174[0.0002]***	3	I(1)
RIR	-3.3113[0.0704]*	4				I(0)
INF	-2.7654[0.2136]	4	ΔINF	-5.8714[0.0000]***	3	I(1)
LGEXP	-2.3676[0.3941]	4	ΔLGEXP	-5.6262[0.0000]***	3	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 5: Results of Unit Root Test with constant and trend: ADF Test

Levels			First Difference			
Variables	ADF-Statistics	Lag	Variables	ADF-Statistics	Lag	*I(0)*
LFSDI	-3.2955[0.0747]*	2				I(0)
FO	-3.2618[0.0825]*	2				I(0)
LTOPN	-2.5433[0.3165]	2	ΔLTOPN	-5.4417[0.0001] ***	1	I(1)
LRGDP	-2.2925[0.4892]	2	ΔLRGDP	-5.0158[0.0004]***	1	I(1)
RIR	-4.8151[0.0409]**	2				I(0)
INF	-3.6062[0.0442]**	2				I(0)
LGEXP	-2.9481[0.1527]	1	ΔLGEXP	-5.4236[0.0001]***	1	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 6: Results of Unit Root Test with constant and trend: PP Test

Levels			First Difference			
Variables	PP-Statistics	BW	Variables	ADF-Statistics	BW	*I(0)*
LFSDI	-3.7720 [0.0275]**	4				I(0)
FO	-2.5288 [0.3177]	5	ΔFO	-5.2584[0.0002]	4	I(0)
LTOPN	-2.1160[0.5358]	4	ΔLTOPN	-5.6522[0.0000]***	3	I(1)
LRGDP	-1.8373[0.6588]	4	ΔLRGDP	-5.2174[0.0002]***	3	I(1)
RIR	-3.3773[0.0008]***	4				I(0)
INF	-2.8754[0.2136]	4	ΔINF	-5.8714[0.0000]***	3	I(1)
LGEXP	-2.8676[0.3941]	4	ΔLGEXP	-5.6262[0.0000]***	3	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Bounds Test for Cointegration

Table 7: Bounds Test Results for Cointegration

Critical Value Bound of the F-statistic: intercept and no trend						
K	90% Level		95% Level		99% Level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
6	2.12	3.23	2.45	3.61	3.15	4.43

Calculated F-Statistics:

F_{LFSDI} (LFSDI|FO, LTOPN, LRGDP, RIR, INF, LGEXP) 9.6409 [0.0000]***

Note: Critical values are obtained from Narayan (2004), *** denotes statistical significance at the 1% level and K is the number of regressors in the bound test equations

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Long-run results (FSDI is the dependent variable)

Table 8: Estimated Long Run Coefficients using the ARDL Approach

ARDL(4, 0, 2, 2, 1, 4, 1) selected based on SBC Dependent Variable: LFSDI

Variable	Coefficient	Standard Error	T-Ratio	P-Values
FO	0.2689	0.0369	7.2911***	[0.0000]
LTOPN	0.3537	0.1057	3.3450***	[0.0013]
LRGDP	0.0873	0.0318	2.7487***	[0.0075]
RIR	-0.1293	0.0346	-3.736***	[0.0004]
INF	-0.0768	0.0317	-2.4238**	[0.0178]
LGEXP	0.6169	0.1481	4.1650***	[0.0001]

Note: ***, **, * imply significance at the 1, 5, and 10 percent levels respectively.
Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

ECM = LFSDI – 0.2689*FO – 0.3537*LTOPN - 0.0873*LRGDP + 0.1293*RIR + 0.0768*INF - 0.6169*LGEXP

Short-run results (FSDI is the dependent variable)

Table 9: Estimated Short Run Coefficients using the ARDL Approach

ARDL(4, 0, 2, 2, 1, 4, 1) selected based on SBC Dependent Variable: DLFSDI

Variable	Coefficient	Standard Error	T-Ratio	P-Values
D(LFSDI(-1))	0.2192	0.0762	2.8749***	[0.005]
D(LFSDI(-2))	0.1656	0.0678	2.4433**	[0.016]
D(LFSDI(-3))	0.1118	0.0562	1.9907*	[0.050]
D(FO)	0.3031	0.1201	2.5233**	[0.013]
D(LTOPN)	0.5982	0.0812	7.3670***	[0.000]
D(LTOPN(-1))	0.5243	0.0788	6.6536***	[0.000]
D(LRGDP)	0.4514	0.0636	7.0975***	[0.000]
D(LRGDP(-1))	0.5429	0.0660	8.2256***	[0.000]
D(RIR)	-0.1114	0.0318	-3.5048***	[0.000]
D(INF)	-0.0996	0.0276	-3.6066***	[0.000]
D(INF(-1))	-0.0524	0.0138	-3.7963***	[0.000]
D(INF(-2))	-0.0642	0.0138	-4.6442***	[0.000]
D(INF(-3))	-0.0847	0.0139	-6.1128***	[0.000]
D(LGEXP)	0.1545	0.0558	2.7688**	[0.011]
C	1.6425	0.1137	14.4394***	[0.0000]
ECM(-1)	-0.6534	0.0915	-7.1410***	[0.0000]
R-squared	0.7358	Mean dependent var.		0.0237
Adjusted R-squared	0.6643	S.D. dependent var.		0.1914

Table 9: Conts

S.E. of regression	0.1109	Akaike info criterion	-1.3684
Residual Sum of Squared	0.9099	Schwarz criterion	-0.8038
Log likelihood	85.9973	Hannan-Quinn criterion.	-1.1402
F-statistic	10.3024	Durbin-Watson statistic	1.9902
Prob(F-statistic)	0.0000		

Note: ***, **, * imply significance at the 1, 5, and 10 percent levels respectively.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Model Diagnostic Tests

Table 10: Model Diagnostics

Diagnostics	Test Statistic
$F_{Auto}(4,73)$	0.88640 [0.476]
$X^2_{Auto}(4)$	2.2202 [0.1157]
$X^2_{Reset}(1)$	1.1494[0.2871]
$X^2_{Norm}(2)$	2.4972 [0.2240]
$X^2_{White}(1)$	1.0485[0.4185]

Note: X^2_{Auto}, X^2_{Reset}, X^2_{Norm}, *and* X^2_{White} are Lagrange multiplier statistics for test of serial correlation, functional form misspecification, non-normal errors and heteroskedasticity respectively. These statistics are distributed as Chi-square values with degree of freedom in parentheses. Values in parentheses [ ] are probability values.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Granger Causality Test

Table 11: Results of Pair-Wise Granger Causality Tests

Null Hypothesis:	F-Statistic	Probability
FO does not Granger Cause LFSDI	5.1958	[0.0001]***
LFSDI does not Granger Cause FO	0.0316	[0.9689]
LTOPN does not Granger Cause LFSDI	4.5567	[0.0006]***
LFSDI does not Granger Cause LTOPN	0.0873	[0.9165]
LRGDP does not Granger Cause LFSDI	0.2773	[0.7585]
LFSDI does not Granger Cause LRGDP	6.1011	[0.0003]***
RIR does not Granger Cause LFSDI	2.7704	[0.0160]**
LFSDI does not Granger Cause RIR	0.2067	[0.8136]
INF does not Granger Cause LFSDI	5.2205	[0.0060]***
LFSDI does not Granger Cause INF	0.0645	[0.9376]
LGEXP does not Granger Cause LFSDI	3.0136	[0.0465]**
LFSDI does not Granger Cause LGEXP	0.2468	[0.7818]

Note: ***, **, * imply significance at the 1, 5, and 10 percent levels respectively.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI2015, GSE2013, and BoG, 2015

APPENDIX B

RESULTS OF THE EFFECTS OF FINANCIAL DEVELOPMENT ON ECONOMIC GROWTH

Unit Roots Test Results

Table 13: Results of Unit Root Test with constant only: ADF Test

Levels			First Difference			
Variables	ADF-Statistics	Lag	Variables	ADF-Statistics	Lag	*I(0)*
LRGDP	-2.1905[0.4892]	2	ΔLRGDP	-5.0158[0.0004]***	1	I(1)
LBSDI	-2.8582[0.1807]	2	ΔLBSDI	-5.4166[0.0001]***	1	I(1)
LSMDI	-3.2883[0.0742]*	2				I(0)
LBMDI	-1.1278[0.7022]	2	ΔLBMDI	-7.1946[0.0000]***	1	I(1)
LGEXP	-2.9471[0.1527]	1	ΔLGEXP	-5.4236[0.0001]***	1	I(1)
RIR	-4.8051[0.0009]***	2				I(0)
LGFCF	-4.3292[0.0043]***	2				I(0)
INF	-3.5062[0.0442]**	2				I(0)
LTOPN	-2.5233[0.3165]	2	ΔLTOPN	-5.4418[0.0001]***	1	I(1)
LFDI	-2.7947[0.2028]	2	ΔLFDI	-8.0157[0.0000]***	1	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Table 14: Results of Unit Root Test with constant only: PP Test

Levels			First Difference			
Variables	PP-Statistics	BW	Variables	PP-Statistics	BW	*I(0)*
LRGDP	-1.8773[0.6588]	4	ΔLRGDP	-5.2174[0.0002]***	3	I(1)
LBSDI	-2.2503[0.4566]	4	ΔLBSDI	-5.6282[0.0000]***	3	I(1)
LSMDI	-3.6138[0.0337]**	3				I(0)
LBMDI	-2.4893[0.3328]	2	ΔLBMDI	-7.1628[0.0000]***	3	I(1)
LGEXP	-2.3676[0.3941]	4	ΔLGEXP	-5.6262[0.0000]***	3	I(1)
RIR	-3.3113[0.0704]*	4				I(0)
LGFCF	-3.2910[0.0738]*	4				I(0)
INF	-2.7654[0.2136]	4	ΔINF	-5.8714[0.0000]***	3	I(1)
LTOPN	-2.1060[0.5358]	4	ΔLTOPN	-5.6522[0.0000]***	3	I(1)
LFDI	-2.7090[0.2354]	5	ΔLFDI	-8.0896[0.0000]***	3	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.
Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Table 15: Results of Unit Root Test with constant and trend: ADF Test

Levels			First Difference			
Variables	ADF-Statistics	Lag	Variables	ADF-Statistics	Lag	*I(0)*
LRGDP	-2.1995[0.4892]	2	ΔLRGDP	-5.0158[0.0004]***	1	I(1)
LBSDI	-2.8682[0.1807]	2	ΔLBSDI	-5.4166[0.0001]***	1	I(1)
LSMDI	-3.2983[0.0742]*	2				I(0)
LBMDI	-1.1288[0.7022]	2	ΔLBMDI	-7.1946[0.0000]***	1	I(1)
LGEXP	-2.9481[0.1527]	1	ΔLGEXP	-5.4236[0.0001]***	1	I(1)
RIR	-4.8161[0.0009]***	2				I(0)
LGFCF	-4.3382[0.0043]***	2				I(0)
INF	-3.6072[0.0442]**	2				I(0)
LTOPN	-2.6233[0.3165]	2	ΔLTOPN	-5.4418[0.0001]***	1	I(1)
LFDI	-2.9957[0.2028]	2	ΔLFDI	-8.0157[0.0000]***	1	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 16: Results of Unit Root Test with constant and trend: PP Test

Levels			First Difference			
Variables	PP-Statistics	BW	Variables	PP-Statistics	BW	*I(0)*
LRGDP	-1.9973[0.6588]	4	ΔLRGDP	-5.2174[0.0002]***	3	I(1)
LBSDI	-2.3503[0.4566]	4	ΔLBSDI	-5.6282[0.0000]***	3	I(1)
LSMDI	-3.7138[0.0337]**	3				I(0)
LBMDI	-2.5893[0.3328]	2	ΔLBMDI	-7.1628[0.0000]***	3	I(1)
LGEXP	-2.4676[0.3941]	4	ΔLGEXP	-5.6262[0.0000]***	3	I(1)
RIR	-3.4113[0.0704]*	4				I(0)
LGFCF	-3.3910[0.0738]*	4				I(0)
INF	-2.8654[0.2136]	4	ΔINF	-5.8714[0.0000]***	3	I(1)
LTOPN	-2.2060[0.5358]	4	ΔLTOPN	-5.6522[0.0000]***	3	I(1)
LFDI	-2.7860[0.2354]	5	ΔLFDI	-8.0896[0.0000]***	3	I(1)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Bounds Test for Cointegration

Table 17: Bounds Test Results for Cointegration

Critical Value Bound of the F-statistic: intercept and no trend						
K	90% Level		95% Level		99% Level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
9	1.95	3.06	2.22	3.39	2.79	4.10

Calculated F-Statistics:

F_{LRGDP} (LRGDP|LBSDI, LSMDI, BMDI, LGEXP, RIR, LGFCF, INF, LTOPN, LFDI) 8.6447(0.0000)***

Note: Critical values are obtained from Narayan (2004), *** denotes statistical significance at the 1% level and K is the number of regressors in the bound test equations.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Short-run results (Economic growth is dependent variable)

Table 19: Estimated Short Run Coefficients using the ARDL Approach

ARDL(4, 4, 4, 4, 4, 2, 4, 1, 4, 2) selected based on SBC Dependent Variable: DLRGDP

Variable	Coefficient	Standard Error	T-Ratio	P-Values
D(LRGDP(-1))	0.4938	0.1190	4.1510***	[0.0001]
D(LRGDP(-2))	0.4487	0.1036	4.3304***	[0.0001]
D(LRGDP(-3))	0.3787	0.0866	4.3746***	[0.0001]
D(LBSDI)	0.1813	0.1594	1.1374	[0.2612]
D(LBSDI(-1))	0.1079	0.1635	0.6598	[0.5126]
D(LBSDI(-2))	0.3651	0.1291	2.8275***	[0.0069]
D(LBSDI(-3))	0.4158	0.1278	3.2542***	[0.0021]
D(LSMDI)	0.0274	0.0135	2.0285**	[0.0482]
D(LSMDI(-1))	0.0687	0.0127	5.4097***	[0.0000]
D(LSMDI(-2))	0.0518	0.0099	5.2259***	[0.0000]
D(LSMDI(-3))	0.0468	0.0094	4.9847***	[0.0000]
D(LBMDI)	0.0487	0.0181	2.6956***	[0.0097]
D(LBMDI(-1))	0.0511	0.0153	3.3398***	[0.0016]
D(LBMDI(-2))	0.0541	0.0145	3.7323***	[0.0005]
D(LBMDI(-3))	-0.0533	0.0125	-4.2570***	[0.0001]
D(LGEXP)	0.3859	0.0987	3.9095***	[0.0003]
D(LGEXP(-1))	0.4206	0.1031	4.0788***	[0.0002]
D(LGEXP(-2))	0.2181	0.0963	2.2639**	[0.0282]

D(LGEXP(-3))	0.2469	0.0916	2.6970***	[0.0097]
D(RIR)	-0.0276	0.0046	-6.0350***	[0.0000]
D(RIR(-1))	-0.0100	0.0030	-3.2985***	[0.0019]
D(LGFCF)	0.2648	0.0638	4.1490***	[0.0001]
D(LGFCF(-1))	0.0574	0.0706	0.8134	[0.4201]
D(LGFCF(-2))	0.1977	0.0637	3.1036***	[0.0032]
D(LGFCF(-3))	0.2260	0.0601	3.7624***	[0.0005]
D(INF)	-0.0162	0.0034	-4.7584***	[0.0000]
D(LTOPN)	0.7439	0.0983	7.5706***	[0.0000]
D(LTOPN(-1))	0.3477	0.1351	2.5733**	[0.0133]
D(LTOPN(-2))	0.2722	0.1282	2.1228**	[0.0391]
D(LTOPN(-3))	0.2741	0.1162	2.3596**	[0.0225]
D(LFDI)	0.2074	0.0313	6.6213***	[0.0000]
D(LFDI(-1))	0.0384	0.0208	1.8467*	[0.0711]
C	0.6927	0.0739	9.3740***	[0.0000]
ECM(-1)	-0.7670	0.1164	-6.59***	[0.0000]

R-squared	0.8387	Mean dependent variable	0.0107
Adjusted R-squared	0.6946	S.D. dependent variable	0.0244
S.E. of regression	0.0135	Akaike info criterion	-5.4706
Sum squared residual	0.0085	Schwarz criterion	-4.2763
Log likelihood	289.1781	Hannan-Quinn criterion	-4.9890
F-statistic	5.8200	Durbin-Watson stat	2.0210
Prob(F-statistic)	0.0000		

Note: ***, **, * imply significance at the 1, 5, and 10 percent levels respectively.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 20: Model Diagnostic Tests

Diagnostics	Test Statistic
$F_{Auto}(4,73)$	0.88640 [0.476]
$X^2_{Auto}(1)$	2.9849 [0.1934]
$X^2_{Reset}(1)$	1.0941[0.3546]
$X^2_{Norm}(2)$	3.4972 [0.1740]
$X^2_{White}(1)$	0.8786[0.6636]

Note: X^2_{Auto}, X^2_{Reset}, X^2_{Norm}, *and* X^2_{White} are Lagrange multiplier statistics for test of serial correlation, functional form misspecification, non-normal errors and heteroskedasticity respectively. These statistics are distributed as Chi-square values with degree of freedom in parentheses. Values in parentheses [ ] are probability values.

Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Granger Causality Test

Table 21: Results of Pair-Wise Granger Causality Tests

Null Hypothesis:	F-Statistic	P-Values
LBSDI does not Granger Cause LRGDP	6.0774	[0.0033]***
LRGDP does not Granger Cause LBSDI	1.2780	[0.2835]
LSMDI does not Granger Cause LRGDP	5.1746	[0.0074]***
LRGDP does not Granger Cause LSMDI	0.4859	[0.1888]
LBMDI does not Granger Cause LRGDP	3.0739	[0.0181]**
LRGDP does not Granger Cause LBMDI	4.0296	[0.1210]
LGEXP does not Granger Cause LRGDP	1.6802	[0.1919]
LRGDP does not Granger Cause LGEXP	4.5810	[0.0127]**
RIR does not Granger Cause LRGDP	2.1534	[0.0437]**
LRGDP does not Granger Cause RIR	0.2775	[0.7583]
LGFCF does not Granger Cause LRGDP	3.3454	[0.0395]**
LRGDP does not Granger Cause LGFCF	1.1181	[0.3312]
INF does not Granger Cause LRGDP	8.0321	[0.0007]***
LRGDP does not Granger Cause INF	1.1096	[0.3340]
LTOPN does not Granger Cause LRGDP	4.1959	[0.0047]***
LRGDP does not Granger Cause LTOPN	1.5173	[0.3781]
LFDI does not Granger Cause LRGDP	5.1043	[0.0092]***
LRGDP does not Granger Cause LFDI	0.3478	[0.1157]

Note: ***, **, * indicates the rejection of the null hypothesis of no Granger causality at 1%, 5%, and 10% level of significance respectively.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

APPENDIX C

RESULTS OF THEANALYSIS OF THE EFFECTS OF FINANCIAL DEVELOPMENT ON POVERTY REDUCTION

Unit Roots Test Results

Table 23: Results of Unit Root Test with constant only: ADF Test

Levels			First Difference			
Variables	ADF-Statistics	Lag	Variables	ADF-Statistics	Lag	I(0)
POV	-3.5571[0.0390]**	1				I(0)
LFSDI	-3.2855[0.0747]*	2				I(0)
LRGDP	-2.1905[0.4892]	2	ΔLRGDP	-5.0158[0.0004]***	1	I(1)
INF	-3.5062[0.0442]**	2				I(0)
LTOPN	-2.5233[0.3165]	2	ΔLTOPN	-5.4417[0.0001] ***	1	I(1)
LGEXP	-2.9471[0.1527]	1	ΔLGEXP	-5.4236[0.0001]***	1	I(1)
LGFCF	-4.3292[0.0043]***	2				I(0)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015

Table 24: Results of Unit Root Test with constant only: PP Test

Levels			First Difference			
Variables	PP-Statistics	BW	Variables	ADF-Statistics	BW	I(0)
LPOV	-4.2135[0.0062]***	2				I(0)
LFSDI	-3.6920 [0.0275]**	4				I(0)
LRGDP	-1.8773[0.6588]	4	ΔLRGDP	-5.2174[0.0002]***	3	I(1)
INF	-2.7654[0.2136]	4	ΔINF	-5.8714[0.0000]***	3	I(1)
LTOPN	-2.1060[0.5358]	4	ΔLTOPN	-5.6522[0.0000]***	3	I(1)
LGEXP	-2.3676[0.3941]	4	ΔLGEXP	-5.6262[0.0000]***	3	I(1)
LGFCF	-3.2910[0.0738]*	4				I(0)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 25: Results of Unit Root Test with constant and trend only: ADF Test

Levels			First Difference			
Variables	ADF-Statistics	Lag	Variables	ADF-Statistics	Lag	I(0)
POV	-3.6571[0.0390]**	1				I(0)
LFSDI	-3.3855[0.0747]*	2				I(0)
LRGDP	-2.2905[0.4892]	2	ΔLRGDP	-5.0158[0.0004]***	I	I(1)
INF	-3.6062[0.0442]**	2				I(0)
LTOPN	-2.7233[0.3165]	2	ΔLTOPN	-5.4417[0.0001] ***	1	I(1)
LGEXP	-2.8471[0.1527]	1	ΔLGEXP	-5.4236[0.0001]***	1	I(1)
LGFCF	-4.3292[0.0043]***	2				I(0)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.

Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Table 26: Results of Unit Root Test with constant and trend: PP Test

Levels			First Difference			
Variables	PP-Statistics	BW	Variables	ADF-Statistics	BW	I(0)
LPOV	-4.5635[0.0062]***	2				I(0)
LFSDI	-3.6933 [0.0275]**	4				I(0)
LRGDP	-1.8763[0.6588]	4	ΔLRGDP	-5.2174[0.0002]***	3	I(1)
INF	-2.8654[0.2136]	4	ΔINF	-5.8714[0.0000]***	3	I(1)
LTOPN	-2.2260[0.5358]	4	ΔLTOPN	-5.6522[0.0000]***	3	I(1)
LGEXP	-2.3776[0.3941]	4	ΔLGEXP	-5.6262[0.0000]***	3	I(1)
LGFCF	-3.2944[0.0738]*	4				I(0)

Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and *I*(0) is the lag order of integration. The values in parenthesis are the P-values.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Bounds Test for Cointegration

Table 27: Bounds Test Results for Cointegration

Critical Value Bound of the F-statistic: intercept and no trend						
K	90% Level		95% Level		99% Level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
6	2.12	3.23	2.45	3.61	3.15	4.43

Calculated F-Statistics:

F_{LPOV} (LPOV|FSDI, LRGDP, INF, LTOPEN, LGEXP,

LGFCF) 8.918337 [0.0000] ***

Note: Critical values are obtained from Narayan (2004), Appendix A1-A3, pp.26-28; *** denotes statistical significance at the 1% level and K is the number of regressors in the bound test equations.

Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Long-run results (POV) is the dependent variable)

Table 28: Estimated Long Run Coefficients using the ARDL Approach

ARDL(4, 0, 1, 0, 1, 3, 0) selected based on SBC Dependent Variable: LPOV

Variable	Coefficient	Standard Error	T-Ratio	P-Values
LFSDI	-0.2761	0.0435	-6.3471***	[0.0000]
LRGDP	-0.8571	0.1311	-6.5384***	[0.0000]
INF	0.0515	0.0212	2.4300**	[0.0345]
LTOPN	-0.0189	0.0087	-2.1724**	[0.0440]
LGEXP	-1.0363	0.2690	-3.8524***	[0.0002]
LGFCF	-0.1022	0.0589	-1.7346*	[0.0867]

Note: ***, **, * imply significance at the 1, 5, and 10 percent levels respectively.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

$$ECM = LPOV + 0.2761*LFSDI + 0.8571*LRGDP - 0.0515*INF + 0.0189*T0PEN + 1.0363*LGEXP + 0.1022*GFCF \quad (69)$$

Short-run results (FSDI is the dependent variable)

Table 29: Estimated Short Run Coefficients using the ARDL Approach

ARDL(4, 0, 1, 0, 1, 3, 0) selected based on SBC Dependent Variable: DLPOV

Variable	Coefficient	Standard Error	t-Statistic	P- Value
D(LPOV(-1))	0.0423	0.0928	0.4562	[0.6495]
D(LPOV(-2))	-0.0761	0.0831	-0.9154	[0.3627]
D(LPOV(-3))	-0.2838	0.0699	-4.0607***	[0.0001]
D(LFSDI)	-0.1060	0.0304	-3.4870***	[0.0003]
D(LRGDP)	-0.6198	0.2122	-2.9210***	[0.0066]
D(INF)	0.0774	0.0101	7.6633***	[0.0003]
D(TOPEN)	-0.0528	0.0108	-4.8819***	[0.0000]
D(LGEXP)	-0.3277	0.1022	-3.2064***	[0.0099]
D(LGEXP(-1))	-0.3424	0.1467	-2.3340**	[0.0406]
D(LGEXP(-2))	-0.5681	0.2894	-1.9630*	[0.0681]
D(GFCF)	-0.0399	0.0225	-1.7716*	[0.0803]
C	-1.5257	0.3590	-4.2497***	[0.0001]
ECM (-1)	-0.3393	0.0790	-4.2941***	[0.0000]

R-squared	0.9430	Mean dependent var.	2.1054
Adjusted R-squared	0.9323	S.D. dependent var.	0.2906
S.E. of regression	0.0756	Akaike info criterion	-2.1761
Sum of squared resid	0.4571	Schwarz criterion	-1.7487
Log likelihood	120.4514	Hannan-Quinn criterion.	-2.0033
F-statistic	88.2788	Durbin-Watson statistics	1.9571
Prob(F-statistic)	0.0000		

Note: ***, **, * imply significance at the 1, 5, and 10 percent levels respectively.

Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Model Diagnostic Tests

Table 30: Model Diagnostics

Diagnostics Statistic	Test
$F_{Auto}(4,73)$	0.86640 [0.476]
$X^2_{Auto}(4)$	2.2302 [0.1857]
$X^2_{Reset}(1)$	2.1494[0.2471]
$X^2_{Norm}(2)$	2.4972 [0.3140]
$X^2_{White}(1)$	1.0785[0.5085]

Note: X^2_{Auto}, X^2_{Reset}, X^2_{Norm}, *and* X^2_{White} are Lagrange multiplier statistics for test of serial correlation, functional form misspecification, non-normal errors and heteroskedasticity respectively. These statistics are distributed as Chi-square values with degree of freedom in parentheses. Values in parentheses [ ] are probability values.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.

Granger Causality Test

Table 31: Results of Pair-Wise Granger Causality Tests

Null Hypothesis:	F-Statistic	P-Values
LFSDI does not Granger Cause LPOV	6.7767	[0.0009]***
LPOV does not Granger Cause LFSDI	0.0858	[0.7199]
LRGDP does not Granger Cause LPOV	4.9277	[0.0001]***
LPOV does not Granger Cause LRGDP	0.5038	[0.1955]
INF does not Granger Cause LPOV	5.3450	[0.0001]***
LPOV does not Granger Cause INF	1.8797	[0.1584]
LTOPEN does not Granger Cause LPOV	2.4885	[0.0263]**
LPOV does not Granger Cause LTOPEN	0.2903	[0.7487]
LGEXP does not Granger Cause LPOV	5.7596	[0.0007]***
LPOV does not Granger Cause LGEXP	1.2544	[[0.2900]
LGFCF does not Granger Cause LPOV	2.3691	[0.0324]**
LPOV does not Granger Cause LGFCF	0.3695	[0.6921]

Note: ***, **, * indicates the rejection of the null hypothesis of no granger causality at 1%, 5%, and 10% level of significance respectively.
Source: Computed by the Author using Eviews 9.0 Package and data from WDI 2015, GSE 2013, and BoG, 2015.