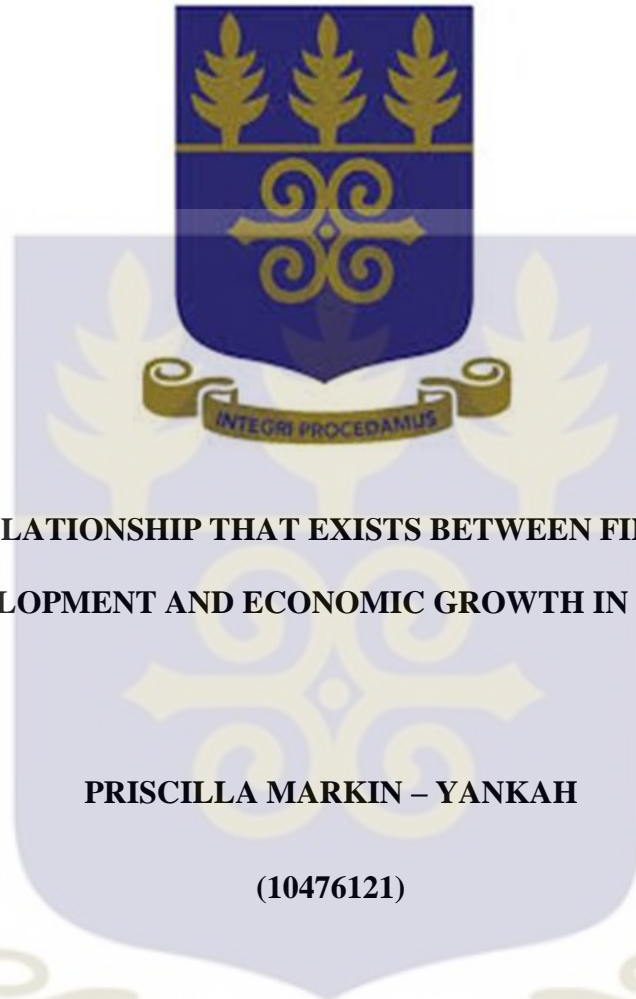


**COLLEGE OF HUMANITIES**

**UNIVERSITY OF GHANA, LEGON**



**THE CAUSAL RELATIONSHIP THAT EXISTS BETWEEN FINANCIAL SECTOR  
DEVELOPMENT AND ECONOMIC GROWTH IN GHANA**

**PRISCILLA MARKIN – YANKAH**

**(10476121)**

**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN  
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER  
OF SCIENCE (M.Sc.) DEGREE IN DEVELOPMENT FINANCE**

**JULY, 2019**

**DECLARATION**

I do hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any university. All references used in the work have been fully acknowledged.

Signature: .....

Date: .....

Priscilla Markin - Yankah

Supervisor's certification

I hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

Signature: .....

Date: .....

Dr. Agyapomaa Gyeke – Dako

(Supervisor)

**DEDICATION**

This work is dedicated to my parents, Mr. and Mrs. Markin-Yankah, my sisters Elsie Nyako and Gertrude Markin-Yankah and my pastor, Pastor Charles Hagan for their incessant encouragement and support.

## **ACKNOWLEDGEMENTS**

I give God the glory for guidance throughout my thesis.

My appreciation goes to Dr. Agyapomaa Gyeke-Dako for her comments and remarks in writing this thesis.

My gratitude also goes to Osei Brefo Kwabena, as he has been of great help throughout this thesis.

I am highly indebted to my parents Mr. and Mrs. Markin-Yankah for their financial support and encouragement.

**TABLE OF CONTENTS**

<b>DECLARATION.....</b>	<b>ii</b>
<b>DEDICATION.....</b>	<b>iii</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>iv</b>
<b>LIST OF TABLES.....</b>	<b>viii</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>ix</b>
<b>ABSTRACT.....</b>	<b>x</b>
<b>CHAPTER ONE .....</b>	<b>1</b>
<b>INTRODUCTION.....</b>	<b>1</b>
<b>1.0 Background of the study.....</b>	<b>1</b>
<b>1.1 Problem Statement.....</b>	<b>2</b>
<b>1.2 Research Objectives.....</b>	<b>4</b>
<b>1.3 Research Questions.....</b>	<b>5</b>
<b>1.4 Significance of the Research.....</b>	<b>5</b>
<b>1.5 Research Scope and Limitations.....</b>	<b>6</b>
<b>1.6 Organisation of the study .....</b>	<b>6</b>
<b>CHAPTER TWO .....</b>	<b>7</b>
<b>LITERATURE REVIEW .....</b>	<b>7</b>
<b>2.0 Introduction.....</b>	<b>7</b>
<b>2.1 Theoretical review.....</b>	<b>7</b>
<b>2.1.1 Schumpeter (1911) .....</b>	<b>7</b>
<b>2.1.2 Stage of development hypothesis by Patrick (1966).....</b>	<b>8</b>
<b>2.2 Growth Models.....</b>	<b>8</b>
<b>2.2.1 Classical (Keynesian) Growth Model.....</b>	<b>8</b>
<b>2.2.2 Neo-Classical Growth Model .....</b>	<b>8</b>
<b>2.3 Endogenous Theory .....</b>	<b>9</b>
<b>2.4 Empirical Review .....</b>	<b>9</b>
<b>2.4.1 Relationship between Finance and Growth.....</b>	<b>9</b>
<b>2.4.2 Positive Relationship.....</b>	<b>10</b>
<b>2.4.3 Negative Relationship .....</b>	<b>12</b>
<b>2.4.4 No Relationship .....</b>	<b>12</b>
<b>2.4.5 Non-Linear Relationship .....</b>	<b>13</b>
<b>2.5 Causal Link between Finance and Growth .....</b>	<b>14</b>

2.5.1	Unidirectional (Finance to Growth) .....	14
2.5.2	Unidirectional (Growth to Finance) .....	15
2.5.3	Bidirectional .....	15
2.5.4	No Causality .....	16
<b>CHAPTER THREE</b> .....		17
<b>METHODOLOGY</b> .....		17
3.0	Introduction.....	17
3.1	Data sources and type.....	17
3.2	Model Specification.....	17
3.3	Data Analysis.....	18
3.4	Variable description.....	18
3.4.1	Economic Growth – Dependent Variable .....	18
3.4.2	Financial Sector Development – Independent Variable .....	18
3.4.3	Control variables.....	20
3.5	Estimation procedures.....	21
3.5.1	Stationarity test .....	21
3.5.2	Unit root test.....	21
3.5.3	Augmented Dickey-Fuller test .....	22
3.5.4	Diagnostic test.....	22
3.5.5	Cointegration.....	23
3.5.6	Auto-regressive Distributed Lag (ARDL) model .....	23
3.5.7	Error correction model (ECM).....	24
3.5.8	Pair wise Granger Causality test .....	25
<b>CHAPTER FOUR</b> .....		27
<b>RESULTS AND DISCUSSION</b> .....		27
4.0	Introduction.....	27
4.1	Descriptive analysis.....	27
4.2	Unit root analysis .....	28
4.3	Test of cointegration .....	29
4.4	Short run effects of financial sector development on economic growth.....	31
4.5	Long Run relationship between financial sector development and economic growth.....	32
4.6	Diagnostic test.....	34
4.7	Pairwise Granger Causality Test.....	35

<b>CHAPTER FIVE .....</b>	<b>38</b>
<b>SUMMARY, CONCLUSION AND RECOMMENDATION .....</b>	<b>38</b>
<b>5.0 Introduction.....</b>	<b>38</b>
<b>5.1 Summary.....</b>	<b>38</b>
<b>5.2 Policy recommendation .....</b>	<b>39</b>
<b>5.3 Conclusion .....</b>	<b>40</b>
<b>REFERENCES.....</b>	<b>41</b>

**LIST OF TABLES**

Table 4.1:	Descriptive statistics for variables.....	28
Table 4.2:	Unit root test analysis for variables.....	29
Table 4.3:	Results of test of cointegration among variables.....	30
Table 4.4:	Short run effects of financial development on economic growth.....	31
Table 4.5:	Long run effects of financial development on economic growth in Ghana...	34
Table 4.6:	Diagnostic Test.....	35
Table 4.7:	Granger Causality test among variables.....	36

### LIST OF ABBREVIATIONS

ADF	Augmented-Dickey Fuller
ADRL	Autoregressive Distributed Lag
BD	Bank Deposits
BM	Broad Money
BMG	Broad Money Growth
CPI	Consumer Price Index
DCPS	Domestic Credit to Private Sector by banks
ECM	Error Correction Model
FINSAP	Financial Sector Adjustment Program
FINSSP	Financial Sector Strategic Plan
GCF	Gross Capital Formation
GFDD	Global Financial Development Database
IMF	International Monetary Fund
INF	Inflation
PCDM	Private Credit by Deposit Money
TD	Trade Openness
WDI	World Development Indicators

## ABSTRACT

This research examines empirically the causal relationship between the development of the financial sector and Ghana's economic growth. In this research findings, data from the Global Financial Development Database (GFDD) and World Development Indicators (WDI) were used. The research employs information from time series data and utilizes a bound test strategy to cointegration within the context of the Autoregressive Distributed Lag (ADRL) to determine the short-term and long-term link between the development of the financial sector and economic growth. Using Unit root analysis to correct non-stationarity as well as using the diagnostic test for determining the robustness of the outcomes, the research discovered that there was a negative connection in Ghana in the short run between private credit by deposit money, broad money growth, domestic credit, inflation and economic growth. There was, however, a positive link between bank deposit, gross capital formation, broad money and economic growth. Trade, however, had no significant influence on financial development. In the long run, with the exception of bank deposits, broad money growth and trade which did not have a significant relationship with economic growth, inflation and domestic credit to private sector had a negative relationship with economic growth whereas the others had a positive relationship with economic growth. There was a uni-directional link between private credit by deposit money, domestic credit to the private sector, trade openness, and economic growth using pairwise granger causality test to ascertain the direction of causality between financial sector development and economic growth, while there was a bi-directional relationship between inflation and economic growth.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Background of the study**

There is the need for finance to develop an economy and there is significant proof in this regard. However, the advancement of the financial system has its pros and cons on growth (Allen, Carletti, Qian and Valenzuela 2014). The beneficial side of financial sector development is its capacity, after offering finance, promoting trade, ensuring the management and diversification of risks, encouraging deposits and, lastly, facilitating goods and service exchange to provide data on potential investment and allocate resources, track investment and corporate management (Bhavani and Bhanumurthy 2012). Financial crises have negative impact on development and are widely spoken of, according to Reinhart and Rogoff (2009). Financial crises are more often than not, characterized by asset market crashes which are profound and protracted, deep decreases in production and jobs. Additionally, the true valuation of public debt ultimately tends to explode in the event of financial crisis.

#### **Ghana's Financial Sector**

Ghana has shifted from an interventionist to an open economic strategy system in the last 30 years, with a notable turnaround from the pre-reform chain in 1988 (Adu, Marbuah and Mensah 2013). The financial system of the country was in an era of repression until the introduction of the financial sector reforms in Ghana. Therefore, the financial system could not conduct its function as an intermediary effectively and efficiently to allocate resources to real economic sectors like production and agriculture which boost growth. Some government institutions, particularly banks, such as the Ghana Commercial Bank, which is overseen by Ghana's central bank, were designated

to channel loans to ‘the non-productive sectors’ of the economy through the combination of an interest-rate policy mix and selective loan checks (Aryeetey, Nissanke and Steel 2000).

At the start of the 1980s, it was evident that strategies introduced by the financial sector in the 1960s and 1970s failed in their effort to mobilize funds for development and also left no space for an enhanced sectoral deepening which left the financial sector shallow.

The introduction and execution in 1988 of the Financial Sector Adjustment Program (FINSAP) was an element of the World Bank and International Monetary Fund's (IMF) extensive macroeconomic reform agenda. This program guaranteed the reorganization of troubled banks. They also assured capital and money market growth, proper pricing, the introduction of structural reforms (including fiscal and financial activities), and a certain amount of privatization (which included banks).

A follow-up to the Financial Sector Adjustment Program was the Financial Sector Strategic Plan (FINSSP) which was mainly introduced in 2001 with almost the same aims as FINSAP, but which aimed to strengthen FINSAP gains and further deepen the financial sector with an enhanced distribution of financial services (Bawumia, 2010).

## **1.1 Problem Statement**

Several other research works have been undertaken concerning the connection the development of the financial sector has with economic growth and the causal link between them. However, only a few of them have been carried out in Ghana.

In their analysis of finance-growth nexus Adu, Marbuah, and Mensah (2013) indicated that the index used to proxy financial development relies on whether financial development is great or poor for growth. Puatwoe and Piabuo (2017) are of a different opinion that the progress of the financial

system and economic growth results vary, owing to multiple research methods. This means that, by the selection of proxies as well as the techniques used, there may be different outcomes of the relationship and causal link between progression of the financial sector and economic growth.

Rana and Barua (2016), in a research study found that broad money, trade balance and domestic credit had no significant impact on stimulating economic growth. The increase in overall debt financing and domestic savings, however, had a significant economic impact. The paper assessed the link associated with economic growth and financial development by employing panel data for five South Asian developing countries. Adu, Marbuah & Mensah (2013) discovered that these financial sector proxies are conducive for growth: credit to private sector as GDP proportions and total domestic credit as proxy. Meanwhile, broad money stock to GDP ratio was not conducive for growth.

Some economic experts believe that the relationship present in economic growth and development of the financial sector has a threshold effect. In order to discover links associated with financial development and economic growth, Law and Singh (2014) used an ingenious dynamic panel threshold method. They included 87 advanced and developing countries in their sample. Their findings showed how the extent of financial development benefited growth to a certain limit. Past the threshold point, further improvement in finance possesses a negative influence on growth. The same perspective was also taken by Cecchetti and Kharroubi (2012). They noted that the level of financial development is favourable until it drags growth. Several researchers, (Cecchetti and Kharroubi, 2015, Cournedes and Denkenk, 2015, Eugster, 2014, Law and Singh, 2014, and Mbome 2016) have confirmed that excess finance results in an inverted U-shape between finance and growth. This inverted U-shape reveals that the link associated with finance and growth is non-linear, consequently, the vanishing or threshold effect.

The causal link of financial sector development in relation to economic growth also has varying opinions. Using the newly established Autoregressive Distributed Lag bound test strategy to cointegration and a causality model based on Error Correction Nyasha, Gwenthure and Odhiambo (2017) concluded that the enhancement of the financial sector and growth of the economy granger cause each other in Ethiopia in the short run. However, a unidirectional granger causality was present between bank-based financial development and economies growth in the long run.

Contrary to the above research, Deren Ünalmiş ' (2002) empirical results using time series data from 1970-2001 indicate that, in the short run, causality runs from financial development to economic growth, with the exception of one of the financial indicators used. In the long run, test findings with the use of Vector Error Correction Model indicate a two-way causality between financial deepening and economic growth for the coefficients of all cointegrated series.

From the above, the relationship together with the causal link with respect to the development of the financial sector and economic growth can be seen as not having a common ground due to differences in variables, environmental circumstances in various countries, different methods used, and the number of proxies used.

This research focuses on variables from financial institutions, particularly banks because data from financial markets, particularly stock markets, was not available between 1960 and 1996.

## **1.2 Research Objectives**

In general, this study aims to identify the causal relationship between the development of the financial sector and economic growth in Ghana. The particular objectives are:

- To examine the short run relationship between Ghana's economic growth and financial sector development.

- To examine the long run relationship between Ghana's economic growth and financial sector development.
- To identify the causal direction between Ghana's economic growth and financial sector development.

### **1.3 Research Questions**

- What is the short run relationship between Ghana's economic growth and financial sector development?
- What is the long run relationship between Ghana's economic growth and financial sector development?
- What is the causal direction between Ghana's economic growth and financial sector development?

### **1.4 Significance of the Research**

The effect on macroeconomic policies of these studies is explicit. For instance, if finance is crucial for Ghana's economic growth, it implies that the supply leading hypothesis proposed by Patrick is relevant here. Thus, fiscal and monetary policy will all be scheduled in a way to reinforce the economy's financial system. On the other hand, when finance is driven by demand, thus, if finance is influenced by growth, the best economic policy should aim at enhancing economic growth. Economic policy should also be geared to suppressing the financial sector if finance is seen to have an adverse impact on growth as proposed by Adusei (2013).

Given the lack of due account of the time allocation of cross-country research and the fact that institutions of various countries are not uniform over time, it leads to erroneous findings about the distinct relationship with reference to financial development and economic growth. Countries

included in cross-country research may vary from each other in terms of certain financial and institutional strategies, making it important to obtain country-specific outcomes that allow non-refutable findings (Ofori-Appiah Danquah, 2016). This is why this research is relevant.

Further research into the causal direction of financial sector development and economic growth in Ghana will be beneficial as a result of this study's results.

### **1.5 Research Scope and Limitations**

This research associates with the economy of Ghana. This makes it possible to use annual time series data from 1960 to 2017. This research examines the causal link between the development of the financial sector and economic growth in Ghana. Data is taken directly from the Global Financial Development Database (GFDD) and World Development Indicators (WDI). The research uses three control variables: trade openness, gross capital formation and inflation which also affect economic growth.

### **1.6 Organisation of the study**

This research is divided into five sections. Chapter one forms the study's introduction and outlines the background, statement of the problem, objectives of the study, research questions, significance, as well as the study's scope and constraints. Chapter two is a literature review which encompasses theoretical and empirical reviews of the causal relationship associated with the development of the financial sector and economic growth in Ghana. Chapter three's main focus is on the methodology specifying the empirical model and techniques of estimation used in this research. The empirical model and estimation techniques are analyzed in Chapter four. The summary, findings and proposed policies are incorporated in Chapter five.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter includes a review of appropriate theories and evidence-based research on the causal relationship between the development of the financial sector and Ghana's economic growth.

#### 2.1 Theoretical review

An advanced and operational financial system that effectively facilitates financial intermediation by reducing transaction and information expenses and also minimizes risk is the theoretical grounds for connecting economic growth to financial development (Adusei 2013).

##### 2.1.1 Schumpeter (1911)

The theoretical link between finance and growth can be drawn from Schumpeter (1911). He opined that economic growth is the result of financial development. His emphasis was on the need for financial institutions and entrepreneurship as well as adequate conditions for economic growth. He concluded that since an economy's financial structure can enable the transfer of resources to the best user, this would lead to a rise in the country's development and output (Nyasha, Gwenhure, and Odhiambo 2017).

Another renowned classical work by Schumpeter in 1911 suggests that financial services provided by financial intermediaries are critical for technological innovation and economic expansion. His theory is centered on the premises of private property, a competitive market, and financial market efficiency that could promote innovative ideas. Therefore, Schumpeter's hypothesis is directed at democratic and economically advanced countries according to Piętak (2014).

### **2.1.2 Patrick's Hypothesis**

The stage of development hypothesis was propounded by Patrick (1966). This hypothesis by Patrick states that over the course of development, the causal direction between financial development and economic growth changes (Carby 2012). He therefore believed that the development of the financial sector will bring about economic growth at the early stage of a country's development. Meanwhile, this growth induces a rise in the need for financial services as an economy experiences real growth. Patrick's hypothesis comprises of the supply-leading and demand following phenomenon. The financial system stimulates economic growth with the supply-leading hypothesis, while demand for financial services rises as a consequence of real economic growth with regards to the demand following hypothesis.

## **2.2 Growth Models**

There are several growth models. There is the Classical growth model, sometimes referred to as the Keynesian model, the Neo-Classical growth model and endogenous theory which point to the notion that finance is essential to economic growth facilitation.

### **2.2.1 Classical (Keynesian) Growth Model**

The Harrod-Domar growth model is a classical growth model that stemmed from Sir Roy Harrod and Evsey Domar's work. The Harrod-Domar (1946) growth model for a closed economy suggests that domestic savings ratios and domestic capital output boost the gross national product (GNP) growth rate.

### **2.2.2 Neo-Classical Growth Model**

The neo-classical growth model, taking into account productivity, capital accumulation, population growth and advancement in technology, was intended to explain long run economic

growth. The relevance of savings and capital investment to promote economic growth was reiterated in Solow's (1956) growth model.

### **2.3 Endogenous Theory**

The concept of the endogenous theory is a present addition to the literature of economic growth where the theory explains the economic factors that can be used to enhance economic growth. Endogenous variables are seen as the main drivers for long-term financial development (Ofori-Appiah Danquah 2016). It is a model whereby investments in research and development along with physical and human capital are significant determinants of economic growth. This model suggests that financial intermediaries can influence the growth cycle by bringing about innovative ideologies via expensive research and development operations, which are generally only feasible if external financing through the financial system is accessible. Endogenous growth models indicate that an open society that promotes technology-based inflows and concepts from the economies of other countries will have fast development levels.

### **2.4 Empirical Review**

The subject of debate by multiple economist has been the relationship and casual direction amidst the development of the financial sector and economic growth.

#### **2.4.1 Relationship between Finance and Growth**

With respect to the connection between development in the financial sector and economic growth, either a positive relationship, negative relationship, no relationship or a nonlinear relationship (inverted U shape) could exist. The positive link in financial sector development with respect to economic growth indicates that the economy keeps improving as the financial sector continues to develop. It could also be a possibility that financial sector improves as the economy flourishes. If there is a development of the financial sector and the economy does not grow, and vice versa, we

can say that an adverse or otherwise a negative relationship is evident between financial sector development and economic growth. The financial sector is considered to be a liability to economic growth according to Asuamah et al. (2012) and does not encourage growth but impedes it. On the other hand, there is no link if progress in the financial sector has no impact on economic growth and there is no impact on the financial sector when there is an improvement in the economy. This is described as a neutral impact by other researchers. This implies that the financial sector is irrelevant to growth and no statistically significant connection can be found between finance and growth (Asuamah et al. 2012). As far as the non-linear relationship (inverted U shape) is concerned, the impact of financial development is thought to have a turning point. That is to say, the level of economic development is acceptable until such time as growth slows (Law and Singh 2014). Others call it the vanishing effect of finance on growth. Allen, Carletti, Qian and Valenzuela (2014) argue that the progress of the financial sector has a positive effect on economic growth at a sufficient financial scope but that when finance becomes excessive its effect disappears or even negates. Excessive finance can trigger economic booms and bubbles in asset price ending in financial crises, followed with poor economic growth levels for continuous periods. It is not desirable to have too little finance. Neither is too much finance desirable.

#### **2.4.2 Positive Relationship**

The impact of financial sector development has been generally considered as having a favorable connection with the growth of the economy, meaning that the financial sector is significant and increasingly prominent for economic growth, according to Bakar and Sulong (2019).

Adusei (2013) found a positive relationship between finance and economic growth using the dynamic Generalized Method of Moments (GMM) approach. The research covered 24 African nations and data was gathered between 1981 and 2010.

A journal with the following results was published by Esso (2010). ECOWAS nations were the domain of his studies. He found that a positive long run relationship between financial development and economic growth exists in Cape Verde, Cote d'Ivoire, Ghana, Guinea and Liberia, with the use of the Pesaran et al. (2001) approach to cointegration strategy and the Toda and Yamamoto (1995) non-causality test method, with data spanning from 1960-2005.

The positive impact of the improvement in the field of finance on economic growth have also been identified by Karlsson and Månsson (2015). But it was only a long run relationship that was established. Their paper used wavelet analysis from 1971 to 2013 on data from 10 Asian economies.

The finance-growth nexus was assessed by Huang and Lin (2009) and the positive link between financial development and economic growth was affirmed. In low-income nations this impact was greater than in high-income nations. Their sample was a cross-section of 71 countries, which was averaged between 1960 and 1995.

Puatwoe and Piabuo (2017) conducted a study using three prevalent economic growth indicators. They included broad money, deposit / GDP and domestic credit to private sector. Employing the Auto Regressive Distributive Lag (ARDL) method of estimation, it was disclosed that a short run positive link between monetary mass (M2), government expenditure and economic growth exists. All financial development indicators, however, showed a positive and substantial effect on economic growth in the long run. Their paper thus proves that all financial development indicators have a positive and long run effect on economic growth through a bound test approach.

### **2.4.3 Negative Relationship**

Either financial crisis during the study era, poor development of the financial sector, below threshold point, inadequate resource allocation by banks or the absence of a propitious private sector investment, could be the cause of the negative relationship associated with finance and growth (Bakar and Sulong 2019).

The negative short run relationship between finance and economic growth, in particularly low-and lower-middle income countries, was proven by Karlsson and Månsson, (2015). Samargandi, Fidrmuc and Ghosh (2015) have confirmed this claim of the negative link between finance and economic growth in the short run. Their study which employed a sample of 52 middle-income nations using data from 1980 to 2008 revealed that excess finance in the chosen nations can have an adverse effect on growth.

Three financial development indicators were employed in a research by Adusei (2013) in Ghana on financial development and economic growth. These were domestic credit as a share of GDP; domestic credit to private sector as a share of GDP; and broad money supply as a share of GDP for the era 1971 to 2010. According to his study, growth of the economy is undermined by financial development.

### **2.4.4 No Relationship**

In the period 1996 – 2005, Dabos and Gantman (2010) examined 98 countries using the dynamic panel technique to determine the relationship in relation to financial development and economic growth. The findings of the regression showed that the connection between financial development and economic growth was not statistically significant.

In a 1991-2008 research by Vuranok (2009) in Turkey, no significant long run connection between financial development and economic growth was discovered, although one of the financial development proxies, which is the proportion of M2 to GDP and GDP were co-integrated at 5% significant level. That is, financial sector development had no long run impact on economic growth.

#### **2.4.5 Non-Linear Relationship**

Berkes and Arcand (2012) examined whether there was a threshold in financial development which when exceeded, no longer had a positive impact on economic growth. They found that, when credit to private sector attained hundred percent of GDP, finance began to have a negative impact on growth, which is in tune with the vanishing effect of the improvement of the financial sector on economic growth.

The Law and Singh's (2014) study supplied details from 87 countries for the era from 1980 to 2010, showing the non-linear relationship between finance and economic growth. Dynamic panel model was used to capture rich dynamics in the growth equation. Their research disclosed that the finance-growth nexus has a financial threshold. When economic development is below the threshold, finance will have a positive impact on growth. This implies that as financial development increases, economic growth will rise. In contrast, the effect of finance on growth will be negative if economic development exceeds the threshold. This indicates that further financial development will not lead to higher economic growth.

Research by Beck, Georgiadis, and Straub (2014) included data from up to 132 countries and spanned the period, 1980 to 2005. They discovered that credit expansion had a positive impact only to a point on per capita output growth. Beyond the threshold, the effect of finance on growth was not statistically significant.

## **2.5 Causal Link between Finance and Growth**

Under causality we will consider unidirectional, bidirectional causality and no causal relationship. Unidirectional causality comes in two parts. The supply-leading hypothesis confirms the causal direction of economic growth from financial development. Alternatively, the demand following hypothesis presupposes the causal relationship between economic growth and financial development is from growth to finance (Karlsson and Månsson 2015). Bidirectional causality is sometimes termed the feedback relationship. This tends to happen when finance causes growth, and growth also causes financial development. There is no causal relationship between finance and growth when finance does not cause growth and vice versa.

### **2.5.1 Unidirectional (Finance to Growth)**

In ten new EU member States, Caporale et. al (2009) examined the primary characteristics of the banking and financial sector and established the connection among financial sector and economic growth variables in those nations through the estimation of a dynamic panel model from 1994-2007. The Granger causality test stated that, causality runs from financial development to economic growth but not in the reverse direction.

Sime's (2016) main goal was to analyze, in Ethiopia from 1973 to 2008, the existence and direction of long run cointegration and causational direction with respect to financial development and economic growth. The results of the Vector Error Correction (VEC) model showed that deposit money bank assets to GDP along with real GDP growth rates have unidirectional causality running from finance to economic growth in the long run.

A research was performed by Malik, Hayee, and Adeel (2018) to ascertain the causal relationship between Pakistan's financial development and economic growth. To comprehend the stationary

level and causal direction in variables, their study used annual data and also made use of dickey fuller and granger causality test. The findings of this experiment supported the supply leading hypothesis that economic growth is as a result of financial development.

In the ECOWAS countries, Ezzo (2010) reviewed the co-integration and causal relationship between financial development and economic growth. Pesaran et al. (2001) cointegration method was used and Toda and Yamamoto (1995) non-causality testing procedure was also adopted. World Bank (2007) data covering the period 1960-2005 was used. He showed that economic growth in Ghana, Liberia and Mali is being driven by financial development.

### **2.5.2 Unidirectional (Growth to Finance)**

By using World Bank (2007) data for the era 1960 to 2005, Ezzo (2010) also discovered that growth triggers financial improvement in Cote d'Ivoire when he reviewed the cointegration together with the causal direction between financial development and economic growth in the ECOWAS countries, using Pesaran et al. (2001) strategy to cointegration and the non-causality method by Toda and Yamamoto (1995).

### **2.5.3 Bidirectional**

Karlsson and Månsson (2015) found that, based on the wavelet analysis on data from 10 Asian economies from 1971 to 2013, there was feedback relationship between financial development and economic growth, although this usually applies only to high-income economies. They examined both the causal directions between financial development and economic growth as well as the signs of their relationships in different scales of time.

Sime (2016) evaluated the presence of long run cointegration and the causal direction of Ethiopia's 1973-2008 financial development and economic growth. In the long run, private credit by deposit

money banks and other financial institutions to GDP ratio and real GDP growth rate possessed bidirectional causality when Vector Error Correction (VEC) model was employed. In addition, Ezzo (2010) found that the direction of causality of Cape Verde and Sierra Leone are bidirectional. Adusei (2013) indicates that a two-fold causal link exists between financial development and economic growth by employing the dynamic GMM model to explore a panel data (1981-2010) finance-growth relationship of 24 countries in Africa.

Katenova, Gissy, and Syzdykov (2017) research findings showed that banks' lending does have a significant impact on Kazakhstan's economic growth. Simultaneously, GDP also impacts the lending of banks considerably. Consequently, there is shared causality in Kazakhstan between banks' lending and economic growth. The economy as well as the financial sector have a positive and significant influence on each other.

#### **2.5.4 No Causality**

Sime (2016) noted there was no short run causality between indicators of financial growth and economic growth. His study's overall objective was to evaluate in Ethiopia from 1973-2008 the presence of long-term co-integration and causal direction between financial development and economic growth.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter includes the specification of the model as well as econometric methods used to attain this study's objectives. Also provided in this section is the explanation of variables, data type, data sources and running of some tests to guarantee that the estimates are reliable.

#### 3.1 Data sources and type

This study employs purely secondary data which is obtained from Global Financial Development Database (GFDD) and World Development Indicators (WDI). The data used is time series which covers the period 1960 to 2017 (58 years).

#### 3.2 Model Specification

Following the works of Puatwoe and Piabuo (2017) and Ofori-Appiah Danquah (2016) the empirical model for this study is:

Economic growth = f (financial sector development, macro-economic environment).

This can be further broken down as:

$$EC_t = \alpha_0 + \alpha_1 PCDM_t + \alpha_2 BD_t + \alpha_3 BMG_t + \alpha_4 DCPSB_t + \alpha_5 BM_t + \alpha_6 GCF_t + \alpha_7 TD_t + \alpha_8 INF_t + \varepsilon_t$$

Where  $EC_t$  represents Economic growth,  $PCDM_t$  represents private credit by deposit money,  $BD_t$  represents bank deposits,  $BMG_t$  represents broad money growth,  $DCPS_t$  represents domestic credit to private sector by banks,  $BM_t$  represents broad money,  $GCF_t$  represents gross capital formation,

$TD_t$  represents trade openness,  $INF_t$  represents inflation,  $\varepsilon_t$  represents the error term,  $\alpha_0$  represents the constant while  $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7,$  and  $\alpha_8$  represent the coefficients.

### **3.3 Data Analysis**

All statistical estimations and analysis are carried out using EViews.

### **3.4 Variable description**

The research looks at both dependent and independent variables together with control variables in order to determine the causal relationship between Ghana's financial sector development and economic growth.

#### **3.4.1 Economic Growth – Dependent Variable**

The growth and improvement in the market value of all goods and services within a country during a specified time period is referred to in economic terms as economic growth. GDP is a significant indicator of economic growth. Gross Domestic Product relates to a country's overall value of goods and services. It involves goods and services generated, as long as they are situated within the borders of the country by residents and foreigners. In order to assess economic growth, annual GDP growth is used for this research.

#### **3.4.2 Financial Sector Development – Independent Variable**

Financial development could be described as an enhancement in the efficacy of five major financial tasks, according to Levine (2005). These include generating and processing data on feasible investments and assigning capital based assets on the basis of these estimates, surveilling companies and individuals, and exercising corporate governance after capital allocation, enabling the exchange of goods, services and financial instruments, as well as promoting the mobilization of savings and risk management and diversification

## **Indicators of Financial Sector Development**

The Global Financial Development Database of the World Bank has created an extensive but comparatively easy conceptual 4x2 structure to measure global financial development. This structure identifies four sets of proxy variables that characterize a sound financial scheme. These include financial depth, access, efficiency and stability. In this research, the development of the financial sector is reflected in two respects of Ghana's financial system; financial depth and financial efficiency.

### **Financial depth**

Financial depth depicts the financial system relative to the economy, according to the World Bank Group. It relates to the size of a country's banks, other financial institutions, and financial markets, relative to an economic output measure. Private credit by deposit money (PCDM), bank deposits (BD), broad money growth (BMG) and broad money (BM) are the proxies used for measuring financial depth for this research.

### **Financial Efficiency**

Regarding financial efficiency, financial intermediaries and markets must operate with the least waste, facilitate financial transactions and work in the best possible way. Domestic credit to private sector (DCPS) is the proxy used to evaluate economic efficiency in conducting this research.

Bank deposits are monies kept in financial institutions, particularly banks, to maintain and secure them. Bank deposits in this study is measured as a proportion of GDP. Domestic credit to private

sector by banks relates to financial resources supplied by deposit taking corporations except Central banks to the private sector. Credit could include loans, purchases of non-equity securities and trade credits. This study measures Domestic credit to private sector by banks as a share of GDP. Broad money is a measure of money supply that encapsulates the components of narrow money as well as monies held in checking accounts, savings accounts, time deposit, overnight loans held by commercial banks as well as securities such as certificate of deposits. Broad as a share of GDP serves as a proxy for broad money. Broad money growth on the other hand is defined as the rate by which broad money increases or decreases from year to year. It is the ratio of the difference of two consecutive years' broad money to the current year's broad money. Private credit by deposit money banks and other financial institutions to GDP constitutes credit to the private sector, average annual Consumer Price Index (CPI), and the CPI period under review.

### **3.4.3 Control variables**

This research uses certain control variables since other factors other than financial sector development variables may affect growth. The control variables employed in this study are gross capital formation, inflation and trade openness.

Inflation refers in a particular time period, to the continuous increase in the general price levels of goods and services. This means that the domestic currency's purchasing power decreases continuously or the costs of goods and services persistently rises. Inflation as calculated using the consumer price index represents an annual percentage change in the cost of purchasing a basket of goods and services by the average consumer, at fixed or changeable intervals, such as year-on-year.

Formerly known as gross national investment, the gross capital formation comprises of outlays on additions to the economy's fixed assets plus net modifications in inventory levels. The fixed assets

include land improvements (fences, ditches, drains, etc.); acquisitions of plants, machinery, and equipment; and construction of highways, railways, and the like, including schools, offices, hospitals, private housing, and commercial and industrial buildings. Inventories are stocks of products retained by companies to satisfy temporary or unforeseen manufacturing or sales volatilities, and "work in progress." Net value acquisitions are also regarded capital formation. Trade openness reflects an economy's level of integration of trade with other countries or how liberalized a country is, in term of trade. Trade openness is the sum of goods and services exported or imported, measured as a proportion of gross domestic product.

### **3.5 Estimation procedures**

This research uses some estimation techniques to evaluate the model's parameters. These include, unit root test, cointegration, diagnostic test and pairwise granger causality test.

#### **3.5.1 Stationarity test**

It is widely known that a time series is stationary if a time shift does not change the distribution's shape. The basic properties of the distribution are constant over time, such as the mean, variance and covariance. Stationarity is essential because most techniques of forecasting suppose that there is stationarity in a distribution. For instance, auto-covariance and auto-correlation depend on stationarity assumption. Non-stationarity may result in unpredictable behaviors such as t-ratios that do not follow a t-distribution or large r-squared values given to variables that are not in the least, correlated.

#### **3.5.2 Unit root test**

In a time series, a unit root is a stochastic trend and is sometimes referred to as a random drift walk. For a time series to have a unit root, it implies that there is a systematic trend that is not easily predictable. In time series, unit root tests essentially check stationarity. The Augmented

Dickey-Fuller (ADF) test is used in testing for stationarity in this research, which is an enhanced variant of the Dickey Fuller Test. Augmented Dickey-Fuller (ADF) test is used because if Dickey Fuller Test is used it could be problematic. In addition, Augmented Dickey-Fuller (ADF) can handle larger and more complicated models.

### **3.5.3 Augmented Dickey-Fuller test**

The Augmented Dickey-Fuller (ADF) test, an upgrade to the Dickey-Fuller (DF) test, was created by Dickey and Fuller in 1979. It requires the same assessment strategy as the Dickey Fuller (DF) test, but the autocorrelation and heteroscedasticity statistics are corrected. By adding the lagged difference term of the predicted variable the Augmented Dickey-Fuller test makes slight changes to the Dickey-Fuller test to take care of the possibility of autocorrelation in the error term. Due to its popularity and extensive applicability, Augmented Dickey Fuller (ADF) test is considered to be better than other root unit tests. A generalized ADF test is specified as  $\Delta y_t = \alpha + \gamma y_{t-1} + \sum_{t=1}^m a_t \Delta y_{t-1} + \varepsilon_t$  where  $\alpha$  is the constant term,  $m$  is the optimal lag length,  $\Delta$  is the difference operator,  $t$  represents the time and  $\varepsilon$  represents the Gaussian white noise. The null hypothesis is  $\gamma = 0$  while the alternative hypothesis is  $\gamma < 0$ . The time series is non-stationary when the null hypothesis is not rejected. On the contrary, rejecting the null hypothesis means that the series is stationary.

### **3.5.4 Diagnostic test**

This study conducts diagnostic tests to check if the regression models are free from econometric problems. The diagnostic tests conducted in this study are serial correlation, normality, heteroscedasticity and functional form. Serial correlation also known as autocorrelation occurs when there is interdependence between error terms. The Breusch-Godfrey Serial Correlation Lagrange Multiplier test is used to test for the presence of serial correlation. Normality occurs

when the residual is approximately normal with zero mean and an identical variance. For the purpose of this study, normality is tested using Jarque-Bera statistics. If the error term variance is not constant but varies between observations, this results in heteroscedasticity. Functional form refers to the algebraic form of the relationship between a regressand and regressors. The forms could be linear, semi-log or double log.

### **3.5.5 Cointegration**

Cointegration is present among two or more time series that are not stationary if they have the same order of integration and a linear blend of the series is stationary. In order to ascertain the presence of a long run relationship between development in the financial sector and economic growth, this study employs the Bounds test approach to cointegration within the Auto-regressive Distributed Lag (ARDL) model.

### **3.5.6 Auto-regressive Distributed Lag (ARDL) model**

Auto-regressive Distributed Lag, is an ordinary least square (OLS) based model which is suitable for both non-stationary times series as well as for time series that has its order of integration mixed. ARDL takes the lead over other cointegration models since it allows the use of variables that are stationary without differencing  $I(0)$  and variables that are stationary after first differentiation  $I(1)$ . However, after second differencing  $I(2)$ , it does not permit variables that become stationary. This method can also be used regardless of whether the variable is  $I(0)$ ,  $I(1)$  or fractionally co-integrated (Pesaran 1997). ARDL includes only one equation setup which facilitates its implementation and interpretation. Various lag-lengths can be allocated to different variables as the model is entered. Moreover, this model utilizes a number of lags that are sufficient to capture the cycle of data generation in a dynamic model of the general-to-specific modeling framework.

A general specification of the ARDL model is  $\Delta R = \partial_0 + \rho_1 t + \rho_2 R_{t-1} + \rho_3 L_{t-1} + \sum_{i=1}^k \lambda_4 \Delta R_{t-1} + \sum_{i=1}^k \lambda_5 \Delta L_{t-1} + \mu_t$  where R is the regressed variable; L is a vector of the predictors; t expresses the time trend, k stands for the lag order,  $\Delta$  is the difference operator and  $\mu$  represents the Gaussian white error term.  $R_{t-1}$  and  $L_{t-1}$  represent the lags of the regressand and explanatory variables respectively and  $\rho_n$  is the coefficient of the vector of individual predictors.

The Bounds test technique to cointegration uses the F-statistic to check the presence of the long-run equilibrium in the variables. The null hypothesis of no cointegration thus ( $H_0: \rho_1 = \rho_n = 0$ ) is verified against the alternative hypothesis ( $H_1: \rho_1 \neq \rho_n \neq 0$ ) of the presence of a long-run relationship, hence cointegration relationship. Thus ( $H_0: \rho_1 = \rho_n = 0$ ) which is the null hypothesis of no cointegration is verified. Meanwhile the alternative hypothesis ( $H_1: \rho_1 \neq \rho_n \neq 0$ ) of the presence of a long-run relationship, hence cointegration relationship is also tested. To compare the critical value bounds which is dependent on the stationarity characteristics of the variables, thus a blend of I(0) and I(1), the test uses the F-statistic. This strategy offers two bounds for decision-making about cointegration. The upper bound is assumed to be I(1) for all series whereas the lower bound is assumed to be I(0) for all series. When the calculated F-statistic has been obtained, if it is beyond the critical value of the upper bound, it can be concluded that a long run relationship between the variables exists, which results in cointegration. On the other hand, if the estimated F-statistic is below the lower bound value, there will be no indication of cointegration. In the case where the F-statistic is between the critical values of the upper and lower bound, no conclusive inference can be drawn.

### 3.5.7 Error correction model (ECM)

As variables stand as a single equation, the ADRL method is free of residual correlation. The error correction model can easily be obtained from simple linear transformation through the integration

of short run adjustments with long run equilibrium without information loss. The ECM is specified as  $\Delta Y_t = c + \sum_{i=1}^m \beta_1 \Delta Y_{t-1} + \sum_{i=1}^m \beta_2 \Delta F_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$  where,  $\lambda ECM_{t-1}$  stands for the equilibrium error which deviates from the long run relationship.  $\varepsilon_t$  is the mutually uncorrelated white noise residual. The ECM coefficient ( $\lambda$ ) provides information on whether previous values impact the present values of the studied variables. A coefficient that is significant means that errors of the previous equilibrium have a part to perform in determining present results. It is worth considering two vital issues. The first is whether  $\lambda \neq 0$  should be considered. The co-integration result will not be trustworthy unless this assumption holds. The second pressing issue is whether it is possible to reject  $H_0: \beta_i = 0$  (all  $i = 1, \dots, m$ ). There is no proof of short run causality if it can be rejected.

### 3.5.8 Pair wise Granger Causality test

The causal relationship between economic growth and financial development is evaluated using pair wise granger causality test. The model to prove the existence of granger causal relationship between economic growth and financial sector development take the following forms;  $\Delta \ln Y_t = \sum_{i=1}^p \beta_1 \Delta \ln Y_{t-1} + \sum_{i=1}^q r_i \Delta \ln F_{t-i} + \varepsilon_t$  with the null hypothesis being that financial development does not Granger cause economic growth in Ghana. This reduces the hypothesis of  $H_0 = r_1 = r_2 = \dots = r_q = 0$  in a restricted manner. Likewise, the equation  $\Delta \ln F_t = \sum_{i=1}^p \alpha_1 \Delta \ln Y_{t-1} + \sum_{i=1}^q \alpha_i \Delta \ln F_{t-i} + \varepsilon_t$  means that growth in the economy does not granger cause financial development. This model is tested by imposing the following restrictions on the parameters on lag differences of real GDP. Specifically, the hypothesis that

$H_0 = \alpha_1 = \alpha_2 = \dots = \alpha_q = 0$  is tested.

Rejection of both null hypotheses implies bidirectional granger causal relationship between economic growth and the development of the financial sector. On the other hand, a concurrent use of both hypotheses does not imply a granger causal relationship is found in the pair of variables investigated. If only one of the hypotheses is dismissed, the assumption is that there is a causal relationship which is unidirectional, running from economic growth to financial development or from financial development to economic growth. If  $H_0 = r_1 = r_2 = \dots = r_q = 0$  is rejected but not  $H_0 = \alpha_1 = \alpha_2 = \dots = \alpha_q = 0$ , then the causal direction is one way, from financial development to economic growth.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Introduction

The findings and analysis based on the research objectives are presented in this chapter. Three sections of the analysis are presented. The first part contains the description of statistics of the research variables. The second section analyzes the link between the development of the financial sector and economic growth. The last section analyzes the causality between the variables.

#### 4.1 Descriptive analysis

In this section, the number of observations, mean, minimum, maximum and standard deviation of the variables considered in the study for 58 years is presented. As indicated in Table 4.1, private credit by deposit money (% of GDP) recorded a mean of 6.28 and the value ranged from 0.8661 to 17.85. The mean score of domestic credit to private sector (% of GDP) was 8.62 and it also ranged from 1.5 to 20.7. Bank deposit (% of GDP) recorded a mean of 36.88 and it also ranged from 8.77 to 84.83. Broad money (% of GDP) also recorded a mean of 23.103 and it ranged from 11.304 to 34.845. Additionally, trade (% of GDP) also recorded a mean of 56.149 and ranged from 6.3203 to 116.048. The mean score of broad money growth was 31.9769 and this ranged from 1.2337 to 68.5298. Gross Capital formation (% of GDP) recorded a mean of 15.3013 and ranged from 3.3776 to 29.0021. A mean of 8.6127 was obtained by domestic credit to private sector by banks which ranged from 1.5422 to 19.6209. Inflation had a mean score of 27.9071 and ranged from -8.422 to 122.87. Lastly, the result shows that economic growth recorded a mean of 3.68 and

it also ranged from -12.43 to 14.047. Table 4.1 depicts the description of statistics for the variables considered in the study.

**Table 4.1: Descriptive statistics for variables**

Variable	Obs	Mean	SD	Min	Max
Private credit by deposit money (PCDM)	58	6.2745	4.5965	.8661	17.8538
Domestic credit to private sector (% of GDP) (DCPS)	58	8.6233	5.1825	1.5423	20.7121
Bank deposits (BD)	58	36.8835	21.004	8.7669	84.829
Broad money growth (annual %) (BMG)	58	31.9769	16.525	1.2337	68.5298
Gross capital formation (% of GDP) (GCF)	58	15.3013	6.3995	3.3776	29.0021
Broad money (% of GDP) (BM)	58	23.1034	6.2740	11.304	34.485
Inflation	58	8.6127	5.0073	1.5422	19.6209
Trade (% of GDP) (TD)	58	56.4192	28.1108	6.3203	116.048
Economic growth (EG)	58	3.6843	4.3919	-12.43	14.047

## 4.2 Unit root analysis

Most time series data depict non-stationarity in their mean. As a result, unit root test is carried out to ensure the series is stationary. Time series is reported to be stationary if the series' mean does not depend on time. Testing for unit root ensures that the results are free from biasedness. Augmented Dickey-Fuller (ADF) was used to test for the existence or presence of unit root in the series. ADF tests the hypothesis that there exists a unit root in the series. The decision to fail to

accept or not reject unit root is done by matching the T statistics with Mackinnon (1996) critical values. The null hypothesis is rejected when the absolute value of the T statistics is greater than the critical value; otherwise, we fail to reject the null hypothesis. Firstly, the study tested for unit root for all variables at levels. The study found that six of the variables employed were stationary at levels and three were also stationary at first difference. Table 4.2 depicts the unit root test analysis for the variables.

**Table 4.2: Unit root test analysis for variables**

Variable	T statistics	Critical values (5%)	Status
Private credit by deposit money	-2.9155	0.50879	I (0)
Bank deposits to GDP (%)	-3.5527	-1.4372	I (0)
Broad money growth (annual %)	-2.9155	-1.6206 ***	I (1)
Gross capital formation (% of GDP)	-2.9135	-2.3055	I (0)
Broad money (% of GDP)	-2.91355	-1.2980	I (0)
Domestic credit to private sector by banks (% of GDP)	-2.91355	-0.927	I (0)
Trade (% of GDP)	-2.9135	-0.91614	I (0)
Inflation	-12.62913	-2.919952 ***	I (1)
Economic growth	-2.9145	-1.8024 ***	I (1)

Note: \*\*\* P<0.01

### 4.3 Test of cointegration

Since the growth and financial development indicators used in this paper are mixtures of I (0) and I (1), it is relevant the study determines the long-run relationship among variables. The

cointegration analysis verifies the long run relationship. It tests for the null hypothesis that the joint coefficients of the lag levels are zero. Table 4.3 depicts Auto Regressive Distributed Lag (ARDL) bound test. Two critical value bounds provide a cointegration test when the explanatory variables are  $I(d)$  where  $0 \leq d \leq 1$ . The lower bound suggests that all independent variables are  $I(0)$  and the upper bound also suggests they are  $I(1)$ . The computed F-test is compared to the critical value, if the F statistics is beyond the upper bound, the null hypothesis is rejected, depicting the presence of cointegration. If the F statistic falls beneath the lower bound, the null hypothesis that there is no cointegration is accepted and when it lies within the upper and lower bound, inference will be inconclusive. As indicated in Table 4.3, at 10% level, the F statistics lies in the interval in the middle of the lower bounds and the upper bounds, hence the inference is inconclusive. However, at 5%, 2.5% and 1%, the F statistics lies below the lower bound, indicating there is no cointegration. The study therefore performs both analysis for short term along with the long term dynamics for the relationship between independent variables and economic growth.

**Table 4.3: Results of test of cointegration among variables**

Critical value Bounds of F-statistic							
10%		5%		2.5%		1%	
I(0)	I(1)	I(1)	I(0)	I(0)	I(1)	I(0)	I(1)
1.95	3.06	2.22	3.39	2.48	3.7	2.79	4.1
F-statistic 1.991377							
Number of explanatory variables: $K=8$							

#### 4.4 Short run effects of financial sector development on economic growth

The first objective of the study was to investigate the short run relationship between financial sector development and economic growth in Ghana. The results in Table 4.4 presents the short run link between financial sector development and economic growth in Ghana. As presented in Table 4.4, an increase by a unit in private credit by domestic money and broad money growth significantly decreases economic growth by 2.99 units and 28.95% respectively in the short run. Also, the study found that a unit increase in domestic credit and inflation rate significantly reduces economic growth by 1.965 units and 14.43% respectively in the short run. Nonetheless, the study found that bank deposit, gross capital formation and broad money significantly increases economic growth by 2.43 units, 22.98% and 58.40% respectively in the short run. It is not surprising that bank deposit has positive impact on economic growth in the short run because as the deposits of banks increases, they are able to give out loans to investors to help them expand their businesses. As they expand their businesses, it triggers economic growth. The coefficient of  $ECM_{t-1}$  suggests that around 313.9% of the deviation from the long run growth is corrected every year. The P value of 0.0003 also confirms the existence of cointegration.

**Table 4.4: Short run effects of financial development on economic growth**

Variable	Coefficient	T-statistic	Prob
$\Delta(PCDM)$	-2.990057	-3.154598 *	0.0103
$\Delta(BD)$	2.438495	3.581486 **	0.0050
$\Delta(BMG)$	-0.189599	-1.954754 *	0.0791
$\Delta(GCF)$	0.2289201	6.044431 ***	0.0001
$\Delta(BM)$	0.584064	2.043350 *	0.0683
$\Delta(DCPSB)$	-1.965355	-6.960126 ***	0.0000

$\Delta(TD)$	-0.144299	-1.659480	0.1280
$\Delta (INF)$	-0.128323	-3.176597 ***	0.0099
C			
$ECM_{t-1}$	-3.139094	-5.432881	0.0003

*PCDM = Private credit by deposit money; BD = Bank deposits; BMG = Broad money growth (annual %); GCF = Gross capital formation (% of GDP); BM = Broad money (% of GDP); DCPSB = Domestic credit to private sector by banks (% of GDP); TD = Trade (% of GDP); \*\*\*  $P < 0.01$*

#### 4.5 Long Run relationship between financial sector development and economic growth

The second objective of the study was to examine the long run relationship between financial sector development indicators and economic growth in Ghana. This objective was achieved by using ARDL model (4, 4, 2, 4, 4, 4, 3, 4). The result as presented in Table 4.5 demonstrates that bank deposits, broad money growth and trade openness excluded, all other variables significantly explain the long run modifications in economic growth in Ghana. Among the variables that significantly influence economic growth, the study found that private credit by deposit money (% of GDP), gross capital formation (% of GDP) and broad money (% of GDP) have positive impact on economic growth in the long run while domestic credit to private sector (% of GDP) and inflation rate have negative impact on economic growth in the long run. This finding corroborates the work of Ofori-Appiah (2016) who also brought to light that the ratio of domestic credit to GDP, broad money and credit to private sector and inflation significantly influence economic growth in Ghana.

The coefficient of private credit by deposit money is positive and significant at 1% level, indicating that, regardless of all other variables, a unit increase in ratio of private credit by deposit money significantly increases economic growth by 83.63 percent in the long run. The coefficient of gross capital formation demonstrates that a unit increase significantly increases economic growth by

33.49% in the long run, regardless of other variables. This finding supports the theoretical proposition that capital stock has positive influence on the growth of the economy of a country. The finding is in sync with that of Aryeetey and Fosu (2006) and Fosu and Magus (2006) who also found that gross capital formation has a positive impact on economic growth in Ghana. The coefficient of broad money in the long run also depicts that a unit increase in broad money, significantly increases economic growth by 31.54% at 1%.

With respect to the variables that exhibited a negative relationship, the study found that a unit increase in domestic credit to private sector by banks and inflation rate significantly decrease economic growth by 32.32% and 11.20% at 1% respectively. The negative association between domestic credit to private sector by banks and economic growth is consistent with that of Ahmad (2008) and Esso (2010) who reported that private sector credit has a negative impact on economic growth in the long run in Sierra Leone. The negative relationship between inflation and economic growth is reasonable in the sense that a rise in inflation raises cost of borrowing which in turn reduces investment from the private sector. Reduction of investment by the private sector will automatically reduce economic growth. Also, higher inflation will cause the cost of goods and services to increase, holding all things constant, this will lead to lower patronage of goods and services. This affects production since consumers no more patronize the commodity, hence causing producers to lower production which will translate to a reduction in the development of the economy. This finding is congruent with that of Ofori-Appiah (2016) who also found that inflation has a negative impact on economic growth in the long run. Table 4.5 depicts the long run effects of financial development on economic growth in Ghana.

**Table 4.5: Long run effects of financial development on economic growth in Ghana**

Variable	Coefficient	T-statistics	P value
PCDM	0.836262	4.236950 ***	0.0017
BD	0.249239	0.813228	0.4350
BMG	0.002037	0.113504	0.9119
GCF	0.334960	8.502944 ***	0.0000
BM	0.315436	3.165898 **	0.0101
DCPS	-0.323287	-3.061372 **	0.0120
TD	-0.054421	-1.253988	0.2384
Inflation	-0.112056	-3.603461 ***	0.0048
C	-5.510072	-2.768998	0.0198

*PCDM = Private credit by deposit money; BD = Bank deposits; BMG = Broad money growth (annual %); GCF = Gross capital formation (% of GDP); BM = Broad money (% of GDP); DCPSB = Domestic credit to private sector by banks (% of GDP); TD = Trade (% of GDP); \*\*\* P<0.0; \*\*P<0.05 \*P<0.1*

$$\text{Cointeq} = \text{GDP\_GROWTH} - (0.8363*\text{PCDM} + 0.2492*\text{BD} + 0.0020*\text{BMG} + 0.3350$$

$$*\text{GCF} + 0.3154*\text{BM} - 0.3233*\text{DCPSB} - 0.0544*\text{TD} - 0.1121*\text{INF} - 5.5101)$$

#### 4.6 Diagnostic test

The research tested for normality, serial correlation and heteroscedascity to guarantee the robustness and accuracy of the outcomes. Normality of the series was tested using Jarque-Bera

statistics. The study concluded that the residual is normally distributed since the Prob = 0.9119 is greater than 0.05. The LM serial correlation test also accept the null hypothesis that there is no serial correlation since P =0.1981 is greater than 0.05. Lastly, Breusch-Pagan-Godfrey was utilised to verify the null hypothesis of no hypothesis.

**Table 4.6: Diagnostic Test**

<b>Test Statistic</b>	<b>F Version</b>
Serial Correlation	F (2,17) = 3.16005 (0.036)
Normality	0.020575 (0.989765)
Heteroscedasticity	F (39, 10) =0.479931 (0.9500)
Functional form	F (1,9) =5.921139 (0.0378)

#### **4.7 Pairwise Granger Causality Test**

Granger causality enables the researcher to investigate the direction of causality of the relationship between two or more variables that are endogenous, that is, the link can be bi-directional or uni-directional. The direction of the causality between economic growth and the various independent variables were obtained using pairwise Granger causality test for lag length 2. The granger causality test results is found in Table 4.7. As indicated in Table 4.7, the study accepts the hypothesis that private credit by deposit money does not granger cause economic growth. Moreover, the study failed to accept the null hypothesis that economic growth does not granger cause private credit by deposit money. This implies there is a unidirectional relationship between private credit by deposit and economic growth. Also, the study failed to reject the null hypothesis that domestic credit to private sector does not granger cause economic growth and the study also

found that economic growth granger causes domestic credit to private sector. This implies there is a unidirectional relationship between domestic credit to private sector and economic growth.

The study failed to reject the null hypothesis that bank deposit does not granger cause economic growth and economic growth does not also granger cause bank deposit. Also, the study found that gross capital formation does not granger cause economic growth and economic growth does not granger cause gross capital formation. The study rejected the hypothesis that broad money does not granger cause economic growth and economic growth does not ranger cause broad money. A similar conclusion is drawn for that of broad money growth. Additionally, the study did not accept the null hypothesis that inflation does not granger cause economic growth and economic growth does not granger cause inflation. This implies that causality between inflation and economic growth goes in both ways. Lastly, the study failed to accept the null hypothesis that trade does not granger cause economic growth. However, the null hypothesis that economic growth does not granger causes trade was accepted. The findings above is consistent with that of Kar, Nazlioglu (2011) who also found that economic growth granger cause domestic money to GDP ratio in Sudan, Bahrain and Kuwait. Also, they found out that ratio of domestic credit to private sector per GDP granger cause economic growth.

**Table 4.7: Granger Causality test among variables**

Null hypothesis	F Statistics	P value	Conclusion
PCDB does not granger Cause EG	2.10924	0.1322	
EG does not granger Cause PCDB	2.91341	0.0637 *	—————>
DCPS does not granger Cause EG	2.27845	0.1132	
EG does not granger Cause DCPS	2.68103	0.0785 *	—————>

BD does not granger Cause EG	0.74855	0.4784	
EG does not granger Cause BD	1.09408	0.3429	
BMG does not granger Cause EG	0.03643	0.9643	
EG does not granger Cause BMG	1.16383	0.3208	
GCF does not granger Cause EG	0.72817	0.1365	
EG does not granger Cause GCF	2.07264	0.4878	
BM does not granger Cause EG	1.10658	0.3386	
EG does not granger Cause BM	2.30607	0.1102	
INF does not granger Cause EG	3.09669	0.0540 *	—————▶
EG does not granger Cause INF	3.02951	0.0573 *	—————▶
TRADE does not granger Cause EG	2.74817	0.0737 *	—————▶
EG does not granger Cause TRADE	0.81309	0.4493	

Note: \* P value<0.1

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.0 Introduction

This chapter presents summary, conclusion as well as policy recommendations. This chapter is presented in three folds. The first section presents the summary of the study. The summary provides brief information on the number of variables used, appropriate methodology and findings regarding each of the objectives. The second section provides conclusion of the study and the last section provides policy recommendations.

#### 5.1 Summary

This research examines the 1960-2017 link between the progression of the financial sector and economic growth in Ghana. The study used variables such as private credit by deposit money banks as a percentage of GDP, domestic credit to private sector as a ratio of GDP, ratio of bank deposit to GDP, broad money growth and ratio of broad money to GDP as proxy variables for financial development. The study also accounted for trade openness, gross capital formation as a percentage of GDP and inflation rate as control variables. The study performed unit root analysis using Augmented Dickey-Fuller test to determine the likelihood of unit root. At first difference, the unit root analysis revealed that three of the variables (broad money growth, inflation, economic growth) were stationary. Whereas the rest of the variables were stationary at levels.

Since the variables were mixtures of  $I(0)$  and  $I(1)$ , the study went further to verify the existence of cointegration using the ARDL bound test. The bound test at 5% 2.5% and 1% suggested the presence of cointegration, hence the study employed the ARDL model to investigate the effect of financial sector development on the growth of Ghana's economy.

The first objective of the study was to investigate the short run relationship between financial sector development and economic growth in Ghana. The study found that private credit, annual broad money growth, domestic credit to private sector and inflation rate has significant negative relationship with economic growth in the short run. The study found that in the short run, bank deposit, gross capital formation and broad money has significant positive relationship with economic growth while trade has no significant link with economic growth in the short run.

The second objective of the study was to investigate the long run relationship between financial sector development and economic growth in Ghana. The study found that ratio of private credit by deposit money to GDP, ratio of gross capital formation to GDP and broad money as a proportion of GDP has significant positive relationship with economic growth in the long run. In addition, the study found that ratio of domestic credit to private sector to GDP and inflation rate in the long run, has significant negative relationship with economic growth. The study found that trade openness, bank deposit and annual broad money growth has no significant long run relationship with economic growth.

The third objective of the study was to examine the causal direction between financial sector development indicators and economic growth using Granger Causality test. The study found that economic growth granger cause PCDM, economic growth granger cause DCPS and trade openness granger cause economic growth while a feedback relationship existed between inflation and economic growth.

## **5.2 Policy recommendation**

Based on the findings presented above, the following policies are recommended. Firstly, policy makers should tread cautiously, the kind of indicator of financial development that they use as a

policy instrument in expanding economic growth. This is necessary because the findings have shown that not all the financial indicators lead to improvement in economic growth.

Secondly, policy makers should implement policies that will promote financial inclusion. Introducing financial inclusion policies will draw most of the unbanked to the banking sector and this can increase bank deposit. As the bank deposit increases, banks will be able to give out loans to private investors to spur growth.

### **5.3 Conclusion**

The study explored the relationship between financial sector development and economic growth in Ghana using data from 1960 to 2017. The study explored the long and short run relationship between financial sector development indicators and economic growth using ARDL model. It was found that private credit, gross capital formation, broad money, domestic credit and inflation have significant impact on economic growth in the long run. Also, the study revealed that trade openness, annual broad money growth and bank deposit have no significant impact on economic growth in the long run. The study disclosed that private credit, bank deposit, annual broad money growth, gross capital formation, domestic credit along with inflation rate has significant impact on economic growth in the short run. In relation to the causal relationship between financial sector development and economic growth, this study found out that there was unidirectional relationship between economic growth and private credit by deposit money banks. The causal relationship was from economic growth to financial sector development. There was also unidirectional relationship between economic growth and domestic credit to private sector. This relationship also run from economic growth to financial sector development. Among trade and economic growth, a unidirectional relationship was evident. This causal relationship was from financial sector development to economic growth. There was bi-causality between inflation and economic growth.

## REFERENCES

- Adu, G., Marbuah, G., & Mensah, J. T. (2013). "Financial development and economic growth in Ghana: Does the measure of financial development matter?". *Review of Development finance*, 3(4), 192-203.
- Adusei, M. (2013). "Finance-growth nexus in Africa: a panel generalized method of moments (GMM) analysis". *Asian Economic and Financial Review*, 3(10), 1314.
- Adusei, M. (2013). "Financial development and economic growth: Evidence from Ghana". *The International Journal of Business and Finance Research*, 7(5), 61-76.
- Ahmad, I., & Qayyum, A. (2008). "Effect of government spending and macro-economic uncertainty on private investment in services sector: Evidence from Pakistan".
- Allen, F., Carletti, E., Qian, J. Q., & Valenzuela, P. (2014). Does finance accelerate or retard growth? Theory and evidence.
- Aryeetey, E., Harrigan, J., & Nissanke, M. (Eds.). (2000). *Economic reforms in Ghana: The miracle and the mirage*. Africa World Press.
- Asuamah, S. Y., & Awuah, E.K.J.B. (2012). What Is the Link Between Finance and Economic Growth? A Review. *European Journal of Business and Management* 4(13), 12–19.
- Bakar, H. & Sulong, Z. (2019). The Role of Financial Sector on Economic Growth: Theoretical and Empirical Literature Reviews Analysis. *Journal of Global Economics* 6(4), 1–6.
- Bawumia, M. (2010). Monetary Policy and Financial Sector Reform in Africa: Ghana's Experience. Combert Impressions Ghana Ltd., Accra, Ghana.
- Beck, R., Georgiadis G., & Straub, R. (2014). "The Finance and Growth Nexus Revisited."

*Economics Letters* 124(3), 382–85.

Berkes, M. E., Panizza, U., & Arcand, M. J. L. (2012). *Too much finance?* (No. 12-161).

International Monetary Fund.

Bhavani, T.A., & Bhanumurthy, N.R. (2012). “Financial Development.” In *Financial Access in Post-Reform India*, Oxford University Press, 40–75.

Caporale, G. M., Rault, C., Sova, R., & Sova, A. (2014). Financial Development and Economic Growth: Evidence from Ten New EU Members.

Carby, Y., Craigwell, R., Wright, A., & Wood, A. (2012). Finance and growth causality: A test of the Patrick's stage-of-development hypothesis. *International Journal of Business and Social Science*, 3(21).

Cecchetti, S. G., & Kharroubi, E. (2012). “Reassessing the Impact of Finance on Growth.” *BIS Working Paper* (381), 1–21.

Cecchetti, S. G., & Kharroubi, E. (2015). Why does financial sector growth crowd out real economic growth?.

Cournède, B., & Dekn, O. (2015). Finance and economic growth in OECD and G20 countries. Available at SSRN 2649935. OECD Economics Department Working Papers No. 1223. Paris: Organization for Economic Cooperation and Development.

Dabos, M. P., & Gantmann, E. R. (2010). The Fading Link? A New Empirical Analysis of the Relationship between Financial Development and Economic Growth. MFI Working Paper Series, No. 2010-013, 1-20.

Esso, L. J. (2010). “Cointegrating and Causal Relationship between Financial Development and

- Economic Growth in ECOWAS Countries.” *Journal of Economics and International Finance* 2(3), 36–48.
- Eugster, J. (2014). Nonlinear marginal effects of finance on growth. *no publicado, IMF, Washington, DC.*
- Fosu, E. O. & Mangus, F. (2006). Bounds Testing Approach to Cointegration: An Examination of Foreign direct Investment, Trade and Growth Relationship, *Journal of American Applied Science*, 3(11), 2079–2085.
- Hasan, R., & Barua, S. (2015). Financial development and economic growth: Evidence from a panel study on South Asian countries. *Asian Economic and Financial Review*, 5(10), 1159-1173.
- Huang, H.C., & Lin, S.C. (2009). “Non-Linear Finance-Growth Nexus.” *Economics of Transition* 17(3), 439–66.
- Kar, M., Nazlioglu, S., Agir, H. (2011) “Financial Development and Economic Growth Nexus in the MENA Countries: Bootstrap Panel Granger Causality Analysis”. *Economic Modelling* 28(1-2), 685-693.
- Karlsson, K. H., & Månsson, K. (2015). “Revisiting the Nexus of the Financial Development and Economic Growth – Wavelet Approach with a Focus on Asian Economies.”
- Katenova, M., Gissy, W., & Syzdykov, Z. (2017). “The Causal Link between Financial Sector and Economic Development: The Case of Kazakhstan.” *International Journal of Business Administration* 8(2), 40.
- Law, S. H, & Singh, N. (2014). “Does Too Much Finance Harm Economic Growth?” *Journal of*

*Banking and Finance* 41(1), 36–44.

Levine R. (2005). “Finance and Growth: Theory and Evidence.” In Philippe Aghion and Steven Durlauf (eds.) *Handbook of Economic Growth*, 865-934.

MacKinnon, J. G. (2010). *Critical values for cointegration tests* (No. 1227). Queen's Economics Department Working Paper.

Malik, M. S., Raisham H., & Raima A. (2018). “Financial Development and Economic Growth: Time Series Analysis of Economy of Pakistan.” *International Finance and Banking* 5(2), 59.

Mbome, M. S. (2016). Financial development, Macroeconomic stability and Growth. Unpublished, University of Milano.

Nyasha, S., Gwenhure, Y., & Odhiambo, N. (2017). The Dynamic Causal Linkage Between Financial Development And Economic Growth: Empirical Evidence From Ethiopia. *Economia Internazionale/International Economics*, 70(1), 73-102.

Ofori-Appiah, E. D. (2017). *The nexus between financial development and economic growth: empirical evidence from Ghana* (Doctoral dissertation).

Patrick, H.T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change* 14 (1), 174–189.

Pesaran M. H., Shin Y., & Smith R. J. (2001). Bounds testing approaches to the analysis of level relationships. *J. App. Econ.* 16, 289-326.

Pesaran, M. H. (1997). The role of economic theory in modelling the long run. *The Economic Journal*, 107(440), 178-191.

- Piętak, Ł. (2014). Review of theories and models of economic growth. *Comparative Economic Research*, 17(1), 45-60.
- Puatwoe, J. T., & Piabuo, S. M. (2017). Financial sector development and economic growth: evidence from Cameroon. *Financial Innovation*, 3(1), 25.
- Reinhart, C. M., & Rogoff, K. S. (2009). The aftermath of financial crises. *American Economic Review*, 99(2), 466-72.
- Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? Evidence from a sample of middle-income countries. *World Development*, 68, 66-81.
- Schumpeter, J.A. (1911). *The Theory of Economic Development*, Harvard University Press, Cambridge, MA.
- Sime, W. (2016). Causality between Financial Development and Economic Growth: Empirical Evidence from Ethiopia:(Johansen and VECM Approaches). *Research Journal of Finance and Accounting*, 7(19), 19–31.
- Solow, M. R., (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, Vol. 70, No. 1. Pp 65-94.
- Toda H. Y., Yamamoto T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *J. Econ.* 66, 225-250.
- Ünalmiş, D. (2002). “The causality between financial development and economic growth : The case of Turkey June 2002. The Central Bank of the Republic of Turkey. Research Department Working Paper No3.”

Vuranok, S. (2009). Study on Financial Development and Economic Growth: A cointegration Approach. *Economic Bulletin*, 29(3), 1670-1677.

World Bank (2007). 2007 World Development Indicators (WDI). World Bank, Washington, D.C.