

**CHRISTIAN SERVICE UNIVERSITY COLLEGE**

**THE IMPACT OF INFLATION RATE AND INTEREST RATE ON  
FINANCIAL SECTOR DEVELOPMENT IN GHANA; TIME SERIES  
APPROACH**

**ADE-TWENEBOAH MICHAEL**

**JUNE, 2018**

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APPROACH**

**BY**

**ADE-TWENEBOAH MICHAEL**

**(14015902)**

**Dissertation submitted to the Department of Accounting and Finance, of the  
School of Business, Christian Service University College, in partial fulfillment of  
the requirements for the award of the Master of Science Degree in Accounting and  
Finance**

**JUNE, 2018**

## **DECLARATION**

### **Candidate's Declaration**

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

Candidate's Signature .....  
Ade-Tweneboah Michael  
(Student)

Date .....

### **Supervisor's Declaration**

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the Christian Service University College.

Supervisor's Signature .....  
Dr. Sulemana Mahawiya  
(Supervisor)

Date .....

## **ABSTRACT**

The development of the financial sector of an economy has been empirically established as an important component of economic growth. The study in using bank private credit to the private sector as a proxy of financial sector development seeks to use causal research design to examine the impact of inflation rate and interest rate on financial sector development in Ghana from 1980-2015. The study also employed time series data and secondary data obtained from the World Bank development indicators and Dynamic OLS regression technique in analyzing the data. Theories existing are divided on the relationship existing between inflation-finance and interest rate-finance. Whilst certain theories are with the opinion of a negative relationship between inflation and financial sector development, others say otherwise. However, generally most theories assert that inflation has a negative impact on FSD. The contrasting opinions are not different with interest rate. Three theories were reviewed under this study; they are the finance-inflation theory, McKinnon-Shaw hypothesis and credit rationing theory. The study established that inflation has a negative and statistically insignificant relationship with financial sector development. Interest rate on the other hand also yielded a negative statistically significant relationship with financial sector development. As part of policy recommendation, this study maintains that, efforts should be made by the government and other monetary institutions to keep inflation rates low and stable. Finally, interest rates should also be low and stable to induce deposit at the banks.

## **ACKNOWLEDGEMENTS**

I am grateful and highly indebted to many outstanding individuals without whom this work would not have been successful. Special and gratitude to the Almighty God for the free provision of care, health, traveling mercies and strength He accorded me.

I am deeply indebted to my supervisor Dr. Sulemana Mahawiya for his personal commitment, encouragement, availability, patience and tolerance during the many discussions which immensely contributed to the success of the project.

May I at this point thank the Lecturers of Christian Service University College for broadening my horizon.

My sincerest gratitude goes to my wife Mrs. Hannah Ade-Tweneboah for her support and prayers.

I wish to express my gratitude to Mr. Jawula Nuhuman for his immense contribution towards the success of this thesis.

## **DEDICATION**

I dedicate this thesis to my wife Mrs. Hannah Ade-Tweneboah, mother; Mad. Victoria Akosua Tweneboah, Sister; Josephine Ade-Tweneboah and my friend; Mathias Antwi Boasiako who have been a great source of encouragement throughout the study.

## **LIST OF ABBREVIATIONS**

<b>Abbreviations-</b>		<b>Meanings</b>
FSD	-	Financial Sector Development
OECD	-	Organization for Economic Co-operation & Development
IMF	-	International Monetary Fund
CAPM	-	Capital Pricing Model
ERP	-	Economic Recovery Programme
SAP	-	Structural Adjustment Programme
FINSAP	-	Financial Sector Adjustment Programme
NBFI	-	Non-Banking Financial Institution

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the Study**

Financial sector development (FSD) by definition refers to a situation where the quality, quantity and the efficiency of financial intermediation services improves (Choong and Chan, 2011) and those individuals and firms benefit from the comprehensive services of financial institutions. Financial institutions and markets play an important role in the process of allocation of funds and savings of individuals to production by reducing the information asymmetry, transaction cost reduction and financial constraints (Khan, 2002).

Financial sector development is a very important and relevant component of economic development. Financial institution according to Mishkin (2006) is like the engine and heart of the economy which coordinate the system in apportioning capital in the economy for the construction of factories, houses and roads. The writer is with the view that the economy will not be able to efficiently operate leading to low levels in economic growth if capital is wrongly allocated or does not flow at all.

Literature has proven that one of the channels to economic growth is through financial sector development, and this is done through raising demand for financial services. It should be noted that income distribution is improved when low income earners have easy access to financial resources.

Several studies from King and Levine, (1996), Rousseau and Watchel (2000), Levine et al. (2000), Beck and Levine (2004), Apergis et al. (2007), Kar et al, (2011)

empirically indicated that financial sector development affects economic growth positively. However other studies argued differently from the likes of Van Wijnbergen (1983), Buffie (1984), Adusei (2013), Fry, (1978, 1980) and Galbis (1977) by saying that financial sector development affects economic growth negatively. Studies from Lucas (1988), Shan and Morris (2002), Andris et al. (2004) were with the opinion of no relationship between financial sector development (FSD) and economic growth. However the general view is that FSD induces economic growth.

Therefore if FSD is important to economic growth, then this study seek to ascertain the level of influence inflation and interest rates have on the development of financial sector. Based on this analogy, the main objective of this research will be to ascertain the impact of inflation rate and interest rate on the development of financial sector in Ghana from 1980-2015, using causal research design, quantitative approach and dynamic OLS technique.

Financial sector development (FSD) is one of the strategies in the private sector to stimulate economic growth and reduce poverty. It comprises the set of institutions, instruments, and legal frame work that allow transactions to be made through the extension of credit (Wikipedia).

Undeniably, financial sector is a financial intermediary that engages in activities such as processing of payments, issuing of drafts and cheques, accepting money on term deposit, lending money, safekeeping of documents and other items in safe deposit boxes, distribution or brokerage, cash management and treasury services, merchant banking, private equity financing, underwriting bonds, interest rates, credit-related securities and many more (Sheffrin, 2003).

Theoretically, financial sector development is the ability of sectors and agents in using a range of financial markets for savings and investment decisions. Encompassing long maturities, financial intermediaries and markets are able to deploy larger volumes of capital and handle larger turnover without necessitating large corresponding movement in asset prices. Developed markets allow savers to invest in a broad range of quality investment and risk sharing instruments and allow borrowers to likewise tap a broad range of financing and risk management instruments (King and Levine, 1993); Rajan and Zeingales (1998); Chami Fullenkamp and Shorma, (2009); Goswani and Sharma (2011).

Globally, financial development is believed to confer important stability benefits to an economy, albeit with caveats, for example by increasing transaction volumes, it can enhance the capacity of intermediate capital flows without large swings in asset prices and exchange rates. However it can also induce capital inflows volatility, complicating macroeconomic management (IMF, 2011).

Developed markets can provide alternative sources of funding during times of international stress limiting adverse spillovers as evidenced in the global crisis. It has also been established that financial development can increase the capacity of emerging markets to generate their own safe or reserve assets, rather than to rely predominantly on United State treasures (Gournchas and Ray 2005; Caballero, Farhi and Gourinchas 2008).

Economists of financial development are with the view that the development of financial sector and economic growth are closely intertwined. They claim that insufficient financial depth lowers welfare and hinders poverty alleviation, and also lack of credit in the economy impedes growth. Increase in growth is a necessary

condition for alleviating poverty in a money market economy where major wealth or income redistribution may be difficult to achieve. Financial development also deals with the design and implementation of policies to accelerate the degree of monetization of the economy through increasing the access of financial services (Pradeep 2001).

FSD is said to be in existence when financial instruments, markets and intermediaries work together to reduce costs of information, enforcements and transaction.

According to Levine (1997), a well-functioning financial sector adequately performs the following five (5) functions to enable it to induce growth positively;

- Producing information on investment and allocating capital
- Monitoring and exerting corporate governance
- Facilitating trading and management of risk
- Mobilizing and pooling of risk
- Easing exchange of goods and services.

Ghana is among the countries with the least developed financial sectors in Africa. The abysmal economic performance of Ghana was criticized on the suppressed post independent economic and financial system (Mahawiya, 2015). The sluggish process in the Ghanaian economy was perceived to be due to the inadequate financial sector development being the integral reason. In an effort to solve it the Structural Adjustment Programme and Economic Recovery Program with the support from the IMF and the World Bank was a policy most of the countries in the sub region in the late 1980's embraced towards economic and financial sector reforms. The main emphasis of the reform was to substitute the rigid economic policies with greater market focused reforms which were perceived not only to influence economic growth



but also the financial system development which will by extension drive economic growth.

The benefits of a well-functioning financial sector are never in doubt. However the success of financial sector development also depends on certain macroeconomic variables of which inflation and interest rates are among these variables.

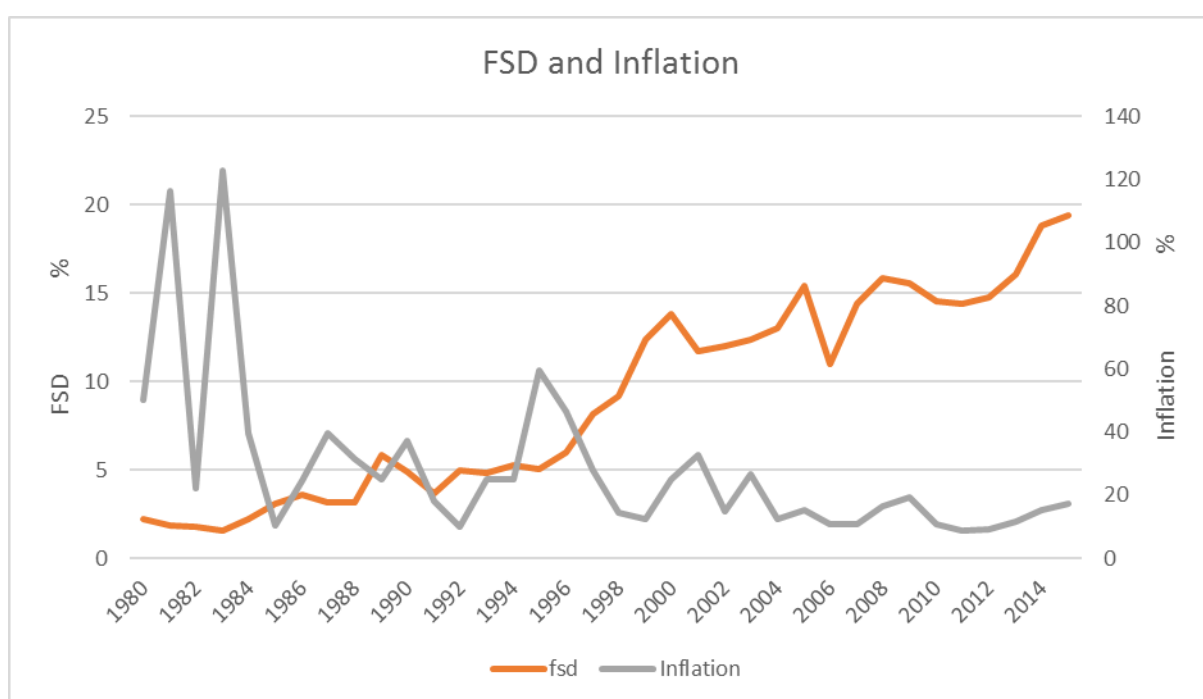
From the view point of Aurangzeb, (2012) inflation is an inevitable property of any economy in the world. According to Greenidge and Dacosta, (2009), inflation has been a topical issue since the early 1970s when oil prices soared to record high figures.

World Bank (2007) defined inflation rate as an annual increase in the price of a basket of goods and services that are purchased by consumers in an economy while the London oxford economic dictionary (2009) defines inflation as the consistent tendency for nominal prices to increase which leads to a decline in the purchasing power in a country's currency.

According to Boyd and Champ (2004) inflation is typically the importunate rise in price level of goods and services in an economy over a period of time. This implies that when price level rises, each unit of currency buys fewer goods and services. Hence, inflation results into a reduction in the purchasing power per unit of money, a loss of real value in the medium of exchange as well as the unit of account within the economy. Imperatively, the very subject of inflation is of immense relevance to the development of the financial sector of every country's economy since its impact affects almost everything.

Furthermore, high inflation rates are caused by tremendous escalation of money supply in the economy, as compared to the rate of economic growth. However, a lower rate of inflation is therefore preferred since it reduces the severity of economic recessions by enabling the labour market to adjust more quickly in a down turn. The principal measure of price inflation is the inflation rate, the annualized percentage change in a general price index that is normally the consumer price index, over time. Moreover, the consumer price index measures movements in prices of a fixed goods and services purchased by a typical consumer. The inflation rate is the percentage rate of change of a price index over time.

To determine visually the relationship between inflation and FSD a graph of the two variables is drawn and shown below in Figure 1.



**Figure 1: FSD and Inflation Rate**

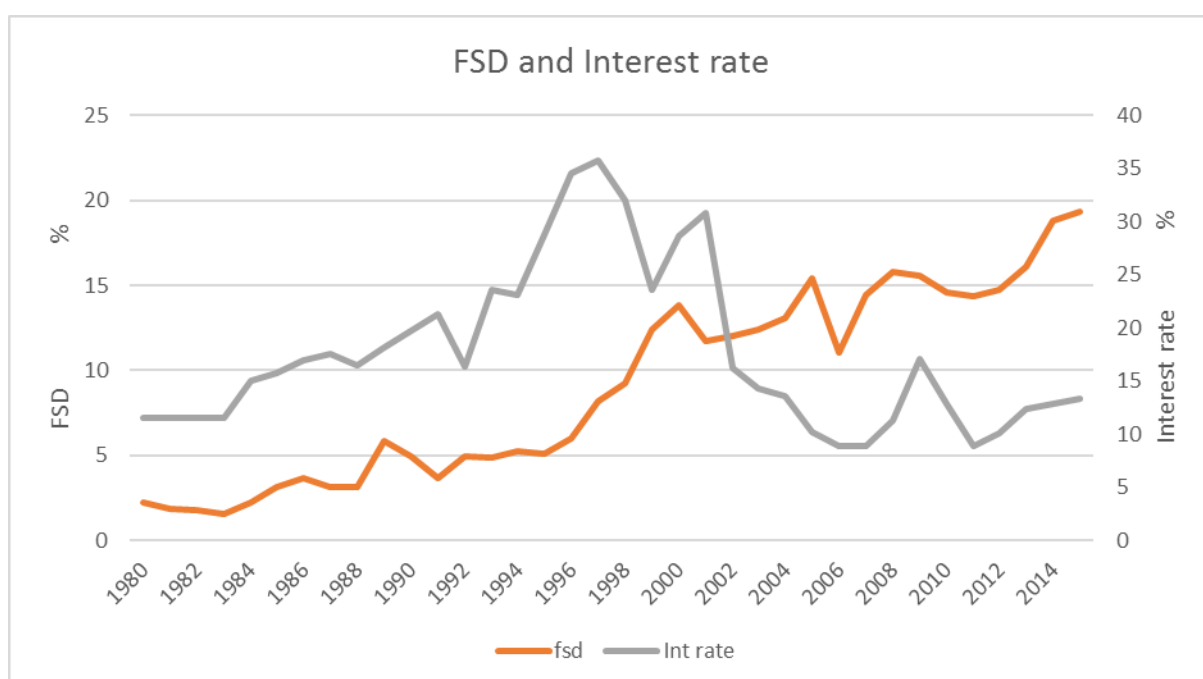
Fig 1 above shows a plot of the relationship between FSD and inflation in Ghana from 1980-2015. Inflation underwent an up and down movement from 1980-1985 whilst FSD was stable in the same period. From 1986-1997, inflation and FSD trended in the same direction with inflation experiencing some volatility. However, from 1998 and beyond, inflation decreased whilst FSD increased exhibiting a negative relationship between the two variables. Could this inverse relationship be as a result of theory that states a negative relationship between the two? This study proceeds to quantify this relationship.

From the view point of Cheboi, (2012) lending is also a subject of cardinal important when it comes to the issue of inflation and financial sector development. The financial sector serves as the main hub where most important savings, mobilization of financial resource, allocations, and institutions are administered. Consequently, these roles make them an important phenomenon in economic growth and development. However, in performing these roles it is of urgent necessity to apply the three fundamental principles which guide the operations of the financial sector. These are profitability, liquidity and solvency (Cheboi, 2012).

Chodechai, (2004) opined that the degree of lending volume and collateral setting in the loan decision of the financial sector, should be administered with care. This is because low interest rates lead to losses such that the money, may not be enough to cover the cost of deposits, general expenses and the loss of revenue if borrowers fail to pay. Moreover, charging too high loan rates may also create an adverse selection situation and moral hazard problems for the borrowers. However, the financial sector lending are influenced by a lot of factors such as the prevailing interest rate, the

volume of deposits, the level of their domestic and foreign investment, liquidity ratio, prestige and public recognition to mention a few. Interest rate is the amount charged as percentage of principal by a lender to a borrower for the use of assets based on the risk level that is the compensation for the loss of asset use by the lender.

To determine visually the relationship between interest rate and FSD a graph of the two variables is drawn and shown below in Figure 2.



**Figure 2: FSD and Interest Rate**

Figure 2 above shows a plot of the relationship between FSD and interest rate in Ghana from 1980-2015. From 1980-2002, the two variables were trending together in an upward direction, indicating a positive relationship between the two variables.

However, after 2002 FSD started to increase whilst interest rate also started to decrease suggesting there could be a negative relationship between the two variables.

From the graph, it is evident that there exist some level of relationship between interest rate and FSD.

Therefore this study seeks to make quantitative analysis on that using bank private credit to the private sector as a proxy of FSD.

In conclusion it can be said that Inflation and interest rates play major roles in the decisions of savers and investors, in the sense that whether individuals will be influenced to deposit their monies at the bank to create access to credit at the bank or will prefer going into other forms of investments are most at times under the influence of these two macroeconomic variables. However most economies and for that matter Ghana has had challenges in dealing with these two variables for the development of the financial sector, hence the study of the impact of inflation and interest rates on FSD.

## **1.2 Problem Statement**

The depressing economic performance in the region has been attributed to reasons as drought, famine, and the reason that agriculture is the principal economic activity. Only 2% of economic growth was contributed by the sub region towards global trade in 2003 (Quartey 2006). However other internal explanations have been recognized for this such as the dysfunctional nature of financial markets and institutions. Again investments continue to be low in this part of the world limiting efforts to diversify economic structures and boost growth.

Financial system assumes crucial role in the development of money economy in the expansion of credit and serve as a connection between the savers and investors. Meaning with insufficient financial development, the risk factor will increase as a

result of lack of competition in the financial sector (Eshaag 1983). In dealing with the risk due to uncertainty as a result of inflation and distress borrowing and poor macroeconomic conditions, banks and other financial institutions charge high premium on their interest rates. This is a setback as it reduces the economic growth of the country due to interest rate. This interest rate charged by these financial institutions is influenced by inflation in preserving the value of their investment, policy of the government and their internal operational cost.

Inflation and interest rates continue to be an economic issue for the academia and other monetary institutions in Ghana. However, volatility in the prices of goods and services continue to be the order of the day, the prices of borrowed monies keep on fluctuating every now and then creating high sense of insecurity and uncertainty among the business community. The monitoring institutions are having challenges with the kind of goods to be put in the ‘ ‘ consumer basket ‘ ‘. The type of goods put in the basket may not be the most purchased items, and as a result governments keep on saying the economy is experiencing low inflation rates yet on the ground the situation is different. Due to this the money market continues to charge high interest rate to preserve the value of their money.

The advanced economies like the United State of America continue to experience robustness in their economy, one of the reasons being stability in the prices of goods and services and putting the right kind of items in the consumer basket.

The financial sector in Ghana has undergone several reforms in the past as already stated in the review of the financial sector in Ghana under literature review. In spite of these reforms, the financial sector in Ghana is relatively the least developed compared

to other developing countries. The question is, what is responsible for the under developed financial sector in Ghana?

Several research works have been done under the topic of discussion as evidenced in empirical literature review. Most of the works carried out are done in the advanced economies like the G-7 and the Organization for Economic Co-operation and Development (OECD) and not in the Ghanaian settings. However, the results are generalized and may be deceptive. This may be misleading since differences exist between developed and developing economies. Per my research much research works have not been done in Ghanaian settings with regards to this topic. This may be the reason for the financial sector development gap in Ghana since policies mostly depend on such findings. Hence, there is a vast research gap when it comes to inflation rate, interest rate and financial sector development. Using quantitative analysis and dynamic OLS technique this study therefore sought to find the impact of inflation and interest rates on financial sector development in Ghana to fill this arduous gap.

### **1.3 Research Objectives**

The study aims at assessing the impact of inflation and interest rates on financial sector development in Ghana from 1980-2015. Specifically, the study seeks to achieve the following objectives:

1. Assessing the impact of inflation rate on financial sector development
2. Determining the impact of interest rate on the development of financial sector.

## **1.4 Research Hypothesis**

To achieve the stated objectives this study seeks to test the following hypothesis.

### **Hypothesis 1**

H<sub>0</sub>: There is no statistically significant relationship between inflation and financial sector development.

H<sub>1</sub>: There is a statistically significant relationship between inflation rate and financial sector development.

### **Hypothesis 2**

H<sub>0</sub>: There is no statistically significant relationship existing between interest rate and financial sector development.

H<sub>1</sub>: There is a statistically significant relationship existing between interest rate and financial sector development.

## **1.5 Significant of the Study**

Empirical literature, theories and several studies such as Levine (2003) have indicated that financial sector is an important component in economic development by way of positively inducing growth in the economy through increasing the level and efficiency of capital and investment. Meritoriously, for every economy, an effective, efficient and adequate financial sector is required in attaining certain levels of growth and development. On the basis of this, this study has the purpose of assessing the influence of inflation and interest rates on the development of the financial sector.



This study is very essential and timely since it is expected to abet policy makers to formulate policies which would enable the efficient distribution and allocation of resources in the country. Worded differently, the empirical findings of the study would assist policy makers in their decisions on resource allocation and distribution between inflation and financial sector development. Conventionally, an empirical study like this is important in determining whether attaining greater heights in economic growth stimulates financial development or whether achieving a sound and adequate financial system will lead to improvement in the country's growth patterns. This in turn would serve as a stepping stone for policy makers in setting-up and prioritizing essential macroeconomic policies to institute competitive growth levels.

Furthermore, the study is intended to enable monetary authorities to have an in-depth understanding of how inflation and interest rates affect financial sector development and devise strategies in mitigating them.

Again, findings from the study would serve as a source of information for other researchers and scholars in the academia. Finally, the findings of the study would add to the existing literature by contributing to the debate and provide different views and ideas to policy makers.

### **1.6 Delimitation of the Study**

This study will be conducted on data spanning from 1980 – 2015 due to time, and space. The main reason for this time span is due to availability of data and also due to the fact that time series data analysis requires a relatively longer data series for all variables included in the estimation process.

### **1.7 Limitation of the Study**

Dependency among variables is one of the weaknesses of OLS. This can lead to poor predictions when a subset of the independent variables fed to it are insignificant correlated to each other. With the lack of robustness in the model, taking decisions and inferences solely on OLS model may be wrong and may not give a true representation of the situation.

### **1.8 Organization of the Study**

The study was organized into five major chapters with each chapter comprising of divisions for the appropriate subsections. The first chapter dealt with the introduction of the study (background), statement of the problem the research, hypothesis, and significance of the study, the limitation, delimitation as well as the organization of the study. The second chapter comprised of the conceptual framework, theoretical and empirical literature reviews with other carefully selected subheadings relevant to the study. Chapter three outlined the standard research methods and designs employed for the study. The results of the data collected were analyzed and discussed in the fourth chapter. The final chapter dealt with the summary of the findings, recommendations as well as conclusion of the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter focused on the review of relevant literatures on inflation, and interest rate and financial sector development in Ghana. Again, the chapter adopted three main broad sections. The first section reviewed the theoretical literature on FSD and inflation, FSD and interest rate. The second section considered some of the empirical reviews on FSD and inflation, FSD and interest rate and finally summary of the chapter.

#### **2.2 Conceptual Framework**

The importance of designing a conceptual framework is to understandably incorporate all the relevant aspects of a concept to arrive at a process that can portray the best possible explanation of the statement of the problem (Brown, Renwick & Raphael, 1995).

As already discussed in chapter one, FSD is made up of set of institutions, instruments and legal framework that allow transactions to be made through the extension of credit.

In this study inflation and interest rates were used in discussing their relationships with FSD. Empirical and theoretical reviews generally have indicated that inflation rate has negative impact on FSD. An increase in inflation will have a negative impact on FSD and a decrease in inflation will lead to a positive effect on FSD. Interest rate on the other hand according to theories reviewed in this work also indicated a negative relationship with FSD. This implies that an increase in interest rate will

hamper the development of the financial sector. A decrease in interest rate on the other hand will lead to an improvement in the financial sector.

Figure 1: proposed conceptual framework on the relationship of inflation and interest rates on FSD



Figure 1 above gives a pictorial relationship of inflation and interest rates on FSD. Both independent variables according to theories reviewed in this work indicated a negative relationship with FSD. As a result, the hypotheses in chapter 1 are generated.

## 2.3 Theoretical Literature on FSD and Inflation Rate

### 2.3.1 Finance-Inflation Theory

Quite a number of studies have given explanations to the circumstances through which an advance forecast in upward turn in rate of inflation impedes the ability of FSD to efficiently apportion resources from the surplus unit to the deficit unit.

Hybens and Smith (1998, 1999), precisely produced a connection which centered on the role information asymmetries play in the credit market. The theory intimated that credit market friction is badly affected as a result of increases in the rate of inflation which eventually also affect FSD negatively hence long run real activity.

The bedrock of their position springs from the fact that the rigorousness of the information friction is deeply rooted in the market. Hence informational friction, the rate of real returns on asset decreases due to an increase in inflation rate. This also deteriorates the credit market friction leading to the rationing of credit. Low real

returns on asset on the other hand is a discouragement on the part of the surplus unit from given out resources, as the return cannot compensate the risk taken in postponing immediate consumption. This scenario however encourages the deficit unit to borrow more as the rate of capital to be paid will not be high, resulting in credit reduction. These outcomes result in increase in low quality borrowers into the credit seekers category, this category of low quality borrowers is mashed and as a result informational friction becomes really intense making the economy experience scarcity of credit. In conclusion financial sector attracts lesser loans under high inflation rates causing FSD unable to efficiently allocate resources thereby reducing intermediation.

The position of this theory which states that inflation rate has a negative relationship with FSD because of information asymmetry may not hold in Ghana in my opinion. This is because Ghana is moving towards being informational efficient. This makes parties to have equal information about a transaction. A clear example is a publication by the Ghana Stock Exchange (GSE) on their website which cancelled trading in the shares of four institutions in Agricultural Development Bank (ADB) until Friday 20<sup>th</sup> July 2018. This was to stop investors from taken decisions that might make them worse off would have been the case if they had more information. Hence a positive relationship between FSD and inflation rate.

### **2.3.2 Theoretical Literature on FSD and Interest Rate**

#### **2.3.2.1 Keyne's Liquidity Preference Theory of Interest Rate**

According to Keynes (1936), interest rate is purely a monetary phenomenon because rate of interest is calculated in terms of money. It is a monetary phenomenon in the

sense that the rate of interest is determined by the supply and demand. Keynes defined interest rate as a reward for parting with liquidity for specific rate.

According to this theory “interest” is not the price for waiting, it is also not the remuneration necessary to call forth saving because one may save money, bury it in his/her farm and get nothing from it in the way of interest. Interest rather is the reward for surrendering liquidity, thus the reward for parting with liquid control over cash for a specific period.

They again state that there are three (3) components of money that determines interest rate returns. These include transaction motive, precautionary motive and speculative motive.

The transaction and precautionary motives for maintaining cash depends on income as they are income elastic. The speculative motive on the other hand affiliates to the desire of firms, individuals and households to take advantage of changes in interest rates. If there is anticipation by people of an increase in the rate of interest in the future, they will try to hold money in cash in order to lend it in the future. Alternatively, if one expects a decrease in the rate of interest, one will immediately like to invest money now in order to benefit from the advantages of high interest rate. Thus an expected rise in the rate of interest induces liquidity preference and an expected fall has the opposite effect. Capital accumulation through deposits at the financial institutions increase as interest rate increases, since higher rate of return will be paid by banks on the deposits. This increases credit at the banks will enable the financial institutions which forms the greater percentage of the financial sector in Ghana to make capital available to those who are in need of them. In the same vein it also prevents individuals and firms to assess credit from the financial institutions as

the rate to be paid the capital will be high. On the other hand low interest rates also become disincentive to the surplus unit to avail the capital to the deficit unit to undertake productive ventures, hence impeding the financial sector in effectively allocating resources. This outcome rather induces borrowing since less is paid as the price of such borrowings.

### **2.3.2.2 The Theoretical Paradigms of Financial Market Liberalization**

In effectively explaining the malfunctioning of the financial markets in developing countries, two theories have been developed. These are financial hypothesis propounded by Mckinnon and Shaw (1973), and credit rationing propounded by Stiglitz and Weiss (1981).

#### **2.3.2.2 (a) Mckinnon-Shaw Hypothesis**

The Mckinnon-Shaw financial repression hypothesis posits that the decline in savings and resources misallocation which results in financial market distortions comes about as a result of policies that lead to artificially low interest rates, directed programs and high reserve requirements. However policies from the government that places ceilings on deposits and lending rates kindle demand for credit whilst this serves as a discouragement to the supply of credit. In situation like this, the high credit demand most at times leads to the implementation of non-pricing plans such as rationing through other means instead of interest rate. This leads to the given of preferential treatment in terms of allocation of loans since people who have friends or connections at the banks are those who are given loans. This practice results in fragmented financial market and the crowding of small and medium enterprises (SMEs) from the formal financial sector. The inability of the SMEs to secure loan from the formal financial sector will result in resorting to the informal financial sector to meet their financial needs. The informal financial sector is usually associated with the imposition

of high interest charges which serve as a constraint to the amount of money one can borrow.

Mckinnon and Shaw (1973) model advocated for the abolishment of repressive financial policies and the adoption of financial deregulation policies such as the removal of ceilings on deposit and lending rates, adoption of a flexible exchange rate regime, abandonment of directed credit policies in order to improve access to finance by businesses and the corporate bodies.

The Financial liberalization view according to Mckinnon-Shaw is with the assertion that allowing deposit and lending rates to be established by the forces of demand and supply will give incentive for savers and investors. There will be motivation for savers to increase savings due to the expected increase in the real interest rate, investors on the other hand will also invest in projects which have high yields and also have the potential of promoting growth. The increase in real interest rate also serves as a disincentive for low yielding investments thereby increasing the average efficiency of investment. Again output increases in growth rate are expected to increase the saving rate. The pursuit of financial market liberalization policies are essential for efficient functioning of financial markets; a condition which would lead to an improvement in access to finance by all businesses.

#### **2.4.2.2 (b) Credit Rationing Theory**

The credit rationing theory by Stiglitz and Weiss (1981) provides another background for evaluating financial market inefficiencies. In developing countries informational asymmetry according to this theory is seen as the brain behind financial market not functioning well. Banks that give out loans are ordinarily worried about the interest rate they receive on the loan and the riskiness of the loan. However, the loan interest



rates charged by these banks have the probability of affecting the perilousness of the loan by either sorting out potential borrowers (adverse selection effect) or affecting the behaviour of borrowers (moral hazards) (Stiglitz and Weiss, 1981 p.393). Thus asymmetrical information problem in credit markets comes in two (2) main form; adverse selection and moral hazards.

Adverse selection problem occurs as a result of diverse borrowers having different possibilities of loan repayment. The projected return to the banks is also reliant on the likelihood of loan repayment. As a result of this, banks are faced the problem of distinguishing “good borrowers” from the bad ones employing a variety of screening devices. The willingness of a borrower to pay a certain level of interest rate is considered as one of the screening devices to detect prospective borrowers with a high possibility of repayment.

Stiglitz and Weiss (1981) are with view that individuals who are willing to take up loans which are associated with high interest rates on the average are worse defaulters. They are prepared to borrow at high interest rates because they recognize that their probability of repaying the loan is less. The profits of the banks are negatively affect as increases in the rate of interest rate increases the riskiness of borrowers.

Again, less risky projects may become unbeneficial and serve as a threat to loan repayment as a result of interest rate being high. In addition, as a result of high interest rates, consideration is given to borrowers with high yielding risky projects because the related high probability of not paying accordingly impend the capital base of the banks. Hence in dealing with the minimization of the risk, banks are advised to give out loans at a comparatively lower rate than the market rate. This rearrangement

of loan assortments therefore suggests that the interest rate machinery will be incapable of accomplishing market rate equilibrium, and credit rationing may be used to allot funds.

Changing the behaviour of borrowers is another way interest rate affects the banks projected return from a loan. Moral hazards problem happens because it is exorbitantly expensive for the banks to successfully monitor the behaviour of borrowers after loans have been given out to them. Therefore banks have to consider the effect of interest rate on the behaviour of borrowers. However increasing rate of interest increases the comparative desirability of riskier projects encouraging firms to divert approved funds to finance only high yielding projects. The high risk connected to these high yielding projects would aim at affecting the probability of loan repayment and accordingly reduce the profitability of the banks. Thus the moral hazard occurrence may persuade lenders to ration credit rather than increase the interest rate when there is a surplus demand for loanable funds.

## **2.4 Empirical Review**

### **2.4.1 Empirical Review on FSD and Inflation Rate**

Studies examining the relationship between inflation and FSD from empirical point of view are centered on cross-sectional, panel and time series analysis. They generally show a strong and statistically significant negative relationship existing between the two variables (FSD and inflation). Both bank-based and market-based financial indicators are used to ascertain the extent of financial development. These frequent used indicators include domestic credit to private sector to GDP ratio, broad money to GDP ratio, commercial banks asset per GDP ratio for the banked-based as well as market capitalization per GDP ratio, valued traded of stock market per GDP ratio for

market –based. Regardless of the variable employed, an objective study generally shows a strong and significant negative connection between inflation financial sector developments, although the direction of causality is still not clear. Again a threshold level of inflation was developed above which inflation affects financial development differently. The subsequent paragraphs will discuss a few of such studies on the inflation-finance nexus.

To begin with, Bittercourt (2008) undertook a study in Brazil examining the impact of inflation on FSD during the periods of 1985 and 2002. The results of the study were initially based on time series and then later panel dataset in performing the analysis which was robust for different estimators and financial development measures. He ascertained that inflation has detrimental effects on financial development at the time.

The study used M3/GDP and credit to the private sector/GDP as measures of financial sector development. These indicators had the largest detrimental effects on inflation during the afore-mentioned periods using dynamic equations.

Intuitively, this emphasizes the importance of inflation in negatively affecting a measure which is broader than M2 by definition and also would not be much affected by financial repression. This explains that inflation adversely influences the provision of payment-deferring instruments that plays a critical role during crisis and also curtails the amount of credit in the economy. The study therefore suggested that poor macroeconomic performances have detrimental effects on financial development. A variable that was important in affecting, for example, economic growth and income inequality. Therefore, a low and stable inflation rate all that it encompasses, was a necessary first step to achieving a deeper and more active financial sector with all its attached benefits.

A panel data methodology on pooled data was adopted by Al-Nasser and Jackson (2012) for fifteen (15) Latin American countries from 1978-2003 to empirically examine the long run connection between inflation and financial sector performance. The study focused entirely on the banking sector as well as the stock markets of the financial sector, they established that there was a negative and statistically significant relationship between banking sector development measures and the level of inflation after controlling other economic factors that may be associated with financial development. Again, they established that inflation was negatively correlated with market capitalization and domestic value traded. This indicated that higher inflation rates depress stock market development in Latin American countries. These results implied that macroeconomic stability should be a primary objective for monetary policy since high inflation is shown to be economically costly (in the form of reduced economic growth rates and the international competitiveness of a country).

Boyd et al. (2001) broadened the study of the link between inflation and financial development by investigating 100 different countries to assess the predictions about the mechanisms by which predictable increases in the rate of inflation interfere with the ability of the financial sector to allocate resources effectively. They employed a panel methodology on time series data for inflation, banking sector activity, equity market size, equity market liquidity the rates of return over the period 1960-1995. Their study indicated that there was a significant and non-linear negative relationship between inflation and both banking sector development and equity market activity.

Moreover, they found evidence of threshold effects in the inflation and financial development link for the 100 different Latin American Countries. For instance, they established that a discrete drop in financial performance for economies with inflation rates exceeding 15%. Finally, their data indicated that more inflation was not matched

by greater nominal equity returns in low-inflation countries, thus nominal stock returns move essentially one-for-one with marginal increases in inflation in high-inflation economies.

Furthermore Ghazouani (2005) extended the work by Boyd et al. (2001) to 11 MENA (Middle East and North African Countries) regions by constructing a dynamic panel model for data spanning 1979-1999 and employed the Generalized Methods of Moment proposed by Arellano and Bond to examine the impact of inflation on financial sector performance. Ghazouani (2005) indicated that inflation had a negative and significant incidence on financial sector development but there was no evidence of thresholds, even after controlling for simultaneity and omitted variable biases. In other words, he showed that a marginal increase of inflation is harmless to stock market performance and banking sector development whatever the rate of inflation.

In a different context, Huang et al. (2010) investigated whether there were any inflationary thresholds in the financial sector growth linkage. However, by applying the Caner and Hansen (2004), instrumental-variable threshold regression approach to the dataset of Levine et al. (2000), they found strong evidence of a nonlinear inflation threshold in the relationship below which financial development exerts a significantly positive effect on economic growth, above which, the growth effect of finance appears to be insignificant.

Furthermore, they established a positive and significant relationship between finance and productivity for inflation rates below the threshold level. They however did not find any such relationship for inflation rates above the threshold level. The results suggested that finance influences growth mainly through the productivity channel.

Khan et al. (2001) using a large cross-country sample, found an empirical support for the existence of a threshold level of inflation; generally of about 3-6% per annum depending on the specific measure of financial depth utilized. For rates of inflation below the threshold level, modest increases in the rate of inflation either had no significant effect on financial market conditions or had small positive effects on the level of financial activity (also depending of the indicator of financial depth used). However, for rates of inflation above the threshold level, increases in the rate of inflation had a strong negative effect on financial development. Given what is known about the relationship between financial markets and growth (following the supply leading hypothesis), it is then not surprising that high rates of inflation are detrimental to growth.

Again Keho (2009), used time-series data to examine the long-run and causal relationships between inflation and financial development for the UEMOA countries. Using the bounds test cointegration approach proposed by Pesaran et al. (2001) and the Granger causality test suggested by Toda and Yamamoto (1995), the study obtained empirical results showing no evidence of a long-run relationship between inflation and financial development for six countries (as against one) and no causality for two countries (as against five). Again the study established that financial development causes inflation in four countries while evidence of a reverse causation was detected for only two countries. His findings, however, showed that causality patterns vary across countries and, therefore, it would be unwise to rely on inferences based on cross section countries studies which implicitly impose cross sectional homogeneity on coefficients.

English (1998) focused on the increased production of financial services to construct a model in which households make purchases either with money or with costly

transactions services produced by firms in the financial sector. In his model, a higher inflation rate leads to households substituting purchased transactions services for money balances thereby boosting the size of the financial services' sector. Using cross-sectional data, a test of his model established that the size of a nation's financial sector was strongly affected by its inflation rate. The results, yet again, suggested an alternative way to measure the costs of inflation.

Kim et al. (2010) employed the Pooled Mean Group estimator of Pesaran and Shin, (1998) to an unbalanced panel data for 87 countries over the 1960-2005 periods and established that a negative long-run relationship coexists between inflation and financial development; with an associated positive short-run liaison. They established a strong link between inflation and financial development, irrespective of alternative financial development measures, control variables and inflation uncertainty proxies. Specifically, higher inflation appears to stymie financial development in the long run but stimulate financial markets activities in the short run. However, when splitting the data into different income or inflation groups, their results were observed only in low-income countries or low-inflation economies. In addition, the long-run impact is observed to be generally much larger than the short-run effect.

Aboutorabi (2012), using a multilateral index and implementing ARDL approach studied the effect of inflation on bank sector performance in Iran during 1973-2007. It was reported that there was a negative relationship between inflation and FSD.

Ozturk and Karagoz (2012) on the other hand in their study using ARDL and cointegration test, analyzed the effect of inflation on FSD in Turkey between the periods of 1971-2009. They also indicated a negative relationship between inflation and FSD.

In Ghana from 1980- 2011, Odhiambo (2012), introduced a multi variable model and estimated it using ARDL approach and an annual data to examine the impact of inflation on FSD, the findings indicated a negative relationship between them.

#### **2.4.2 Empirical Review on FSD and Interest Rate**

Empirical studies on the relationship between FSD and interest rate is not common. However the following literature is discussed.

Masson et al. (1998), undertook a study in People's Republic of China( PRC), found a positive effect of interest rates on saving, implying that an increase in interest rate induces an increase in savings and by extension an increase in FSD and vice versa. Nabar (2011), on the other hand within the periods of 1996-2009 used a provincial data in which an increase in urban savings rates in PRC was negatively associated with a decline in real interest rates.

Galac and Kraft (2000), investigated deposits interest rates for the United States and discovered that foreign banks were noted to give lower deposit interest rates than the domestic banks. This negative interest rate elasticity portrays larger differentials for foreign banks in financial crisis times as compared to domestic banks.

From 2008-2012 in Pakistan, Khan and Sattar (2014), examined the impact of interest rate changes on the profitability of commercial banks. Their results showed that interest rate and commercial banks profitability are strongly and negatively correlated using Pearson correlation method.

Nganga and Wanyoike (2017), undertook a study on the effect of interest rate controls on stock performance. Their findings exhibited a negative relationship between



interest rate controls and performance of stocks in the market. Meaning, higher interest rate reduces stock market performance.

Gull and Zaman (2013), evaluated the impact of interest rate fluctuations and financial outcomes of banking sector in Pakistan using a sample of 20 banks listed at Karachi stock exchange KSE for the period of 2007-2012. It was concluded that interest rate has negative significant effect on financial performance.

Malik et al. (2013), examined the market interest rate effects on banks profit. They divided the banking sector into public sector bank and private sector bank. They concluded that there is a significant negative effect on the profitability of both private and public but it affects the private sector the most.

According to Hsing (2004), adopted a structural VAR model that allows for the simultaneous determination of several endogenous variables such as output, real interest rate, and stock market index. The study found a negative relationship between stock prices and interest rate.

Furthermore, the studies from Jawaid and Anwar (2012) used the error correction model (ECM) to examine monthly short term interest rate and banking sector stock returns in Pakistan over the period of 2004-2010. The study concluded that a significant negative relationship existed between interest rate and stock market returns. This provided support for the predictions of the Free Cash Flow to Equity model (Copeland et al. 1994; Damadoran, 1998). It implies that rising interest rate could depress the performance of the stock market either by reducing the uptake of credit and constraining investments or by shifting investments from stock to more profitable bank deposits or fixed income securities.

However the following writers had contrasting findings. Asiama (1996), from 1964-1994 used time series data to examine the savings model he postulated for the Ghanaian economy. He established that there is existence of a positive relationship between real interest rates and both financial savings and real savings, implying saving rates responsiveness to real interest rates.

An examination of the relationship between stock market capitalization and interest rate was conducted by Ologunde (2006) in Nigeria employing regression technique and time series data obtained from Central Bank of Nigeria (CBN) and Nigeria Stock Exchange. The empirical result showed the prevailing interest rate exerts positive influence on stock market capitalization.

From 1994-2011, another study was conducted in Pakistan by Akbar, Ali and Khan (2012), they applied VECM to examine the relationship between the treasury bills rate and stock market in the short run. They established that treasury bills rate had a positive relationship with stock returns in the short run. This implied that investments in the stock market continued in the short run even when the treasury bill rate was upward trend. A possible explanation for this trend may be that investors in Pakistan viewed the treasury bill rate as a risk free and demanded for higher rate of return.

In the same vein, Lagat and Okendo (2016), in their research on the impact of fluctuations of interest rate on bank financial performance indicated a positive relationship between interest rates and bank financial performance.

Notwithstanding Kipngetich (2011) also used regression model to examine the relationship between interest rate and bank financial performance. The study established a positive insignificant relationship between them.

Again Ojeaga and Odejimi (2013), researched on the impact of interest rate on bank deposits in Nigeria. The researchers established that nominal interest rate has a strong positive effect on deposits hence influencing customer savings.

Hermes et al (2011), studied the impact of high interest rate on bank performance and loan delinquency rates on borrowers. A positive relationship was established between the two.

Additionally, Molyneux and Thornton (1992), from 1986-1989 used pooled data to examine the profitability of banking zone of 15 European nations' data. The study established a positive relationship between return on equity and the level of interest rates.

English (2002) and Hanweck and Ryu (2005), stated that the fluctuations of interest rate has significant positive effect on banks net income incurred by interest rate which is also evidenced from the slope of the yield curve.

Oshikoya (1992), examined interest rate liberalization and its effect on savings function in Kenya. The findings showed a significant positive impact on real interest rate, after controlling for terms of trade effects and the effect of financial repression on the functional form of the equation.

There was a study from Odhiambo (2008), who employed cointegration and error correction techniques to examine the impact of interest rate reforms on financial deepening and savings in Tanzania. The study established a positive relationship between financial deepening and domestic savings

More so, Ongweso (2005), examined the linkage between interest rate and non-performing loans in Kenya from 2000-2004. The findings showed a positive

relationship between interest rate and non-performing loans whereby an increase in the interest rates resulted in a high non-performing loans.

### **2.4.3 Summary/Conclusion**

In summary, several theoretical outlines have attempted to explain the impacts of inflation and interest rates on financial sector development. This study looked at four (4) theories under the theoretical review; these are finance-inflation theory, Keynes's liquidity preference theory of interest rate, McKinnon- Shaw hypothesis and Credit rationing theories.

The various empirical and theoretical discussions above on the nexus between inflation-interest rates on FSD show differing views on the topic under study.

While some studies established positive associations, others found negative associations. Some even established no relationship at all. Subsequently, no consensus has yet to be achieved.

However it can be seen that most of the studies were done in the advance economies with different economic indicator whose findings are most at times generalized. Therefore per my search no work has been done in Ghanaian setting on this topic.

## **2.5 Inflation and Financial Sector Development**

The interrelationship study between inflation and financial development has become an important issue for monetary authorities in recent times given the current emphasis on inflation targeting as the primary monetary policy framework. Though the positions of this subject theoretically are diverse, a considerably large body of empirical works have provided support for the proposition that inflation affects financial development negatively, thus stability of the price must be an essential

precondition for successful financial development (Boyd et al., 1996; 2001; Ghazouani, 2005; Khan and Senhadji, 2008; Huang et al., 2010; Keho, 2009).

While this suggestion seems appropriate and realistically suitable, there exist little disagreement amongst many monetary authorities on its definition and subsequently ways of achieving it. Papademos (2006), defines inflation (price stability) as “a state in which the general price level is literally stable or the rate of inflation is sufficiently low and stable, so that considerations pertaining to the nominal dimension of transactions does not become an important factor for economic decisions”. In the same vein, Volcker (1983) sees stability of prices as a “situation in which expectations of generally increasing or decreasing in prices over a considerable period are not a persistent influence on economic and financial behavior.” Additionally, Greenspan (1996), also says that price stability takes place when “economic agents do not take cognizance of the prospective change in the general price level in their economic decision making.” In the opinion of the European Central Bank, price stability is an increase in the general level of prices below 2% a year. Acquah (2005a), a former governor of the Bank of Ghana (BoG) (2002), sees an average rate of inflation of some 20% a year, over a ten period of not falling within the definition of price stability. Fischer (1996; 1983) from an operational point of view believes price stability represents a rate of inflation between 0-3%. Meltzer (1997), on the other hand considers price stability as an inflation rate so close to zero.

These disagreements concerning the acceptable rate of inflation notwithstanding, the world monetary authorities still maintains that price stability is an important pillar for modern monetary policy operation, since it does not only creates the necessary

conditions for successful financial development, but also is a means to an end. It promotes economic growth, job creation and social cohesion (McDonough, 1997; Acquah, 2005b).

Literature in recent times explaining the inflation-financial sector development link from the likes of Mahawiya (2015), Boyd et al.,(1996), Keho (2009), established an inflation threshold, above which inflation affects financial development differently than below and subsequently affecting important economic variables, particularly economic growth. Boyd et al. (1996), for example is with the view that if current inflation rate goes beyond the threshold levels of inflation, high steady state activity cannot be achieved and financial markets frictions become relatively more severe, further inducing endogenously arising instability in important economic variables. This posits that even though stability of the price might be an important prerequisite condition for a successful financial sector development, the recognition of such critical levels of inflation also add light to addressing the adverse impact of inflation on financial sector development.

Inflation is a key determinant of the financial sector lending rates globally. According to Santoni (1986), inflation depreciates the value of money such that a percentage increase in inflation results into a similar percentage fall in the value of the country's currency. Broadly, inflation theorists attribute inflation to monetary causes and maladjustments in economic system (Chand, 2008). The impact of inflation on the financial sector has been a considered issue in the developing countries.

From a study conducted by Taner (2000), on the effects of inflation uncertainty in the financial sector, it was revealed that unpredictable inflation raises interest rates,

decreases loan supply and affects development. This therefore suggests that an increase in inflation may raise the lending rates and lead to low lending volumes. Emon (2012), affirmed this assertion that lenders are very aware that inflation erodes the value of their money over the time period of a loan, so they increase the interest rates to compensate for the loss. The increased interest rates may therefore influence the borrowing patterns of any financial sector. This also suggests that there is a positive relationship between the inflation rates and the lending rates even though the extent to which one affects the other for different time periods is not certain. A cursory gaze into the impact of inflation and interest rates on the financial sector development of many countries suggest an urgent need for a thorough research study to be carried out to ascertain the very actuality of the impact of inflation on the financial sector development in Ghana.

De Gregorio (1993), in his previous investigations obtained empirical findings which supported the assertion that there is a negative impact of inflation on financial sector development.

Price stability in Ghana though for a long period of time especially in the most part of the late 1990 and 2000 has been an essential objective for monetary policy for effective and efficient operation of financial institutions, the extent of financial development in the country continues to be negligible. Gockel and Akoena (2002) described banking in Ghana as urbanized and elitist with the marginalization of local enterprises from the credit market. As there has not been a significant change in recent times, the degree to which price stability has been defined and the framework to achieving it in the country has been criticized as inflation has been following a

drastic downward trend (70.82% in 1995 and 10.82% in 2006) with financial development responding insignificantly.

This question falls within the realm of an old standing debate on the mechanisms through which the adverse link between inflation and economic growth could be addressed through the financial development, giving the positive relationship between financial development and economic growth. Evidence presents that the way inflation hurts economic growth was through its interference with the role financial intermediaries actively play in an economy. High inflation negatively affects developments in the financial system, exacerbate credit market frictions and ultimately making financial institutions inefficient in allocating resources for growth (Huybens and Smith, 1998; 1999; Boyd and Smith, 1998).

## **2.6 Interest Rate and Financial Sector Development**

Rate of interest according to encyclopedia of economics (1982), is the price paid for the use of money overtime. It is usually expressed as a rate charged or earned per period, hence interest rate.

According to Culbertson (1972), interest rate and prices are set in the market by voluntary dealings between buyers and sellers. Interest rates are intimately involved with the role of the actors in the economic game. Like any other price, interest rate must be determined in a broad sense by the demand and supply for that service.

According to Delong, (2001), interest rate is the price at which the rate of purchasing power can be shifted from the future into the present, borrowed today with a promise



to pay back with interest in the future. Interest is not a single lump sum but an ongoing stream of payments.

Since interest rate is usually a price paid to borrow money, it is obvious that interest rate is a monetary phenomenon. However from a different point of view, when one person borrows money, another is purchasing a claim in the future being it an equity share, a bond or simply a promise to repay. The rate of interest can therefore be viewed as the price established by the interactions of supply and demand for future.

Rate of interest is also defined as a percentage paid on premium on money at a point in time in terms of money. Money is a commodity which can presently and a future date be traded, interest rate is also known as cost of money or price, and the place of trade is also known as money market, Fisher (1930). According to Thygeson (1998), interest rate is the ‘rent’ paid to borrow money in compensation for forfeiting other uses of funds by the lender including personal consumption. The initial amount given out as a loan is called the principal and the amount added to the principal is also called interest rate.

Radha (2011) also defines sees interest rate as the amount of money received with regards to the loaned amount which is generally expressed as a ratio of dollars. However Sanya and Gaertner (2012) is with the view that a distinction between specific interest rate and interest rate should be made in general. Specific interest rates on a particular financial instrument for example, a mortgage or bank certificate of deposit reflect the time for which the amount is loaned, the risk that the amount may not be repaid and current supply and demand in the market place for funds available for lending Saddiqui (2012).

The likes of Aboagye et al. (2008) argued that due to inflation and central bank rates, interest rate always experiences changes, as a result of the positive relationship between the two variables (inflation and interest rate). It changes from bank to bank depending on asset, staff cost, market power among other factors.

Pradeep (2001) conducted a study of some selected Asian economies in relation to the impact of real interest rate in the economy. The study depicted a support for the liberalization of the interest rate, and it should be done gradually. Financial savings is one aspect of savings, as interest rate increases there may be a substitution effects between financial assets leaving the total savings unchanged.

There is this argument that savings are mobilized when interest rates are high. Gupta (1987) conducted a research among developing Asian countries of 22 periods. He suggested that there is a positive substitution effect on the real interest rate on savings which dominate the income effects, the most important factor being the real income.

The study of Zarruk, Emilio and Madura (1998), exhibited that a key variable in the financial system is the spread between lending and deposit interest rates. When it is too huge, it is generally regarded as a considerable impediment to the expansion and development of financial intermediation as it discourages potential savers with low returns on deposits. This reduces financing for potential borrowers, thus reducing feasible investment opportunities and therefore the growth potential of the economy. The spread between loans and deposits rates are one of the principal points of financial institution. When the lending rate is high and deposit rate is low, it induces high profit for the financial institution, this becomes a discouragement to the depositor. This negatively affects the confident level of depositors. Borrowers will

also not borrow from the financial institution as they charge high interest rates leading to a reduction of investment opportunities.

A study by Maisal and Robert (1978), indicated that financial institution is the degree and responsiveness with which financial institution react to new information and move funds among asset and liability classes so as to equalize marginal cost and return. Many analysts are with the opinion that markets are efficient, that information and transaction costs are insignificant and atomic and that borrowing, lending, hedging and arbitrage are simple and available at a close or risk free. Based on this assumption, they believe that prediction of results of all types of markets and actions can successfully be done without institutional forces. When there is an availability of market information, it reduces cost and increase efficiency of transaction such as hedging and arbitrage without taking any risk on the basis of the available information as they can predict the results of any market without considering the forces.

The impact of interest rate on the economy is very huge and influencing the rate is one of the strongest tools at the disposal of a central bank. Debt as a form of the capital structure is usually employed by companies to fund expansion, this allow productive assets to pay themselves off by bringing in revenue for the company. Companies will have to use their own money to embark on expansion without borrowing, this places a lot of constraints on the liquidity of the company.

When rates of interest are low, companies can use money to expand through securing credit lines from the banks, vendor financing in the case of equipment purchasing or using bond. Bonds which have a higher rate can also be used to settle existing debt thus improving the company's profitability. This positively affects FSD as individuals and corporate bodies will have access to loans for expansion and also undertaken new

productive ventures. If inflation rate is higher than the rate of return on investment, it loses its real value. A high interest rate on the other hand affect the company's net income through higher interest rate payments, stock markets also falls as monies are taken back from the stocks and put into low risk investments.

Interest rates also affect assets through the insurer's investment portfolio. Low interest rates tend to decrease the supply of premiums owing to the fact that portfolios of most property and causality insurers consist largely of government, municipal and high grade corporate bonds according to NAIC (2011), which intrinsically are highly correlated with the key interest rate (Merton, 1973). In fact researchers that investigate the interest rate impact on the insurance industry often refer to bond yields as interest rate.

A decline in the investment portfolio yield of insurance companies forces the insurance industry to raise premiums in order to cover expenses. Owing to the elasticity of supply for insurance (Grum, 1994), the amount of insurance policies sold eventually decreases as well.

Insurer's liabilities are also subject to duration if the firm is leveraged. Higher rates increase the cost of capital and reduce net income. Although in most cases duration of assets exceed duration of liabilities (Doherty and Garven, 1995), therefore there is weakness in such explanation for the negative relationship between interest rates and insurers financial results.

Alternatively, there is another explanation from a perspective of financial theory for the negative impact of high interest rates on insurers' profitability: the capital pricing model (CAPM), modified for the insurance industry (Fairly, 1979; Hill (1979), Haley (1993), Doherty and Garven (1995) and Leng and Meier (2002), use CAPM along

with other similar insurance pricing models to justify the negative relationship between interest rates and the performance of the insurance industry. An interest rate in a form of a risk free rate is used to discount earnings and obtain an internal rate of return.

The rise of interest rates reduce the internal rate of return, however it has no effect on accounting profit figures which are used for empirical testing.

It is believed that as a general rule, a decrease in rate of interest is best for the economic environment. When there is affordability on the part of consumers to borrow funds as result of paying less on the cost of capital hence decreasing the default risk. This enables individuals to acquire house loans, personal loans, credit cards and investing in stock market.

It also provide the corporate world the chance to take up new capital investment, spending and increase the firm confidence by making heavy investment in growing sector and mobilizing huge revenue. This result in stabilizing the economy and providing employment opportunities and also increasing the income levels of the populace.

The extent to which money policy interventions affect the real economy of interest rate changes in GDP and households has been one particular question which keeps on repeating itself in economics. In the views of the economists, monetary policy is critical in pushing for financial intermediation, as the policies determine the overall economic growth and financial access IMF (2009).

Finally high rate of interest makes the cost of money more expensive and as result crowd out private demand particularly when investment posits a significant sensitivity

to changes in interest rate. This could lead to decrease on aggregate demands both directly through investment and indirectly through activities IMF (1999).

Mostly, the relationship between the supply of money and the demand of borrowers determine the current or market rate of interest. When the supply of money available for investment increases faster than the requirements of borrowers, interest rate tends to fall. Conversely, interest rate generally rises when the demand for investment funds grow faster than the available supply of funds to meet those demands. Corporate executives will not borrow money at an interest that exceeds the return they expect the use of the money to yield (Khan and Rheinart, 1990).

## **2.7 Overview of Financial Sector in Ghana**

The financial sector composes of a wide range of organizations that handles financial management activities. In Ghana financial services are categorized into three (3) main sectors; banking and finance (including non-banking financial services and forex bureau), insurance and financial and capital markets. The operating institutions include foreign and local major banks, Rural and Community Banks (RCBs), Savings and Loans Companies (SLCs) and other finance and leasing companies.

From the opinion of Akuoko (2000), in reference to Databank report, 2003, the post-independence era up to 1983 witnessed the implementation of a planned and closed economy with a varied range of constraints in the financial sector. These constraints included import licensing, exchange controls and directed lending. There was an assumption of total domination and control of the banking sector by the government as a result of these restrictions, where international banking involving remittances, letters of credit, and collections, allocations of foreign exchange, travel or tourism were carried out by the Bank of Ghana. Again the Bank of Ghana was given the

power to control the banking system, set ceilings on advances or investment banks. A greater percentage of the commercial banks' loan portfolio was used to meet public sector borrowing requirement and the state enterprises.

In 1976 saw the advent of rural banks which was tasked to provide banking services to the rural communities. The non-banking financial sector was relatively underdeveloped with the exception of State Insurance Corporation (SIC) and National Trust Holding Company (NTHC). The control systems were not conducive to the economy and the financial sector as it created some level of distortions in both the financial sector and the economy as a whole.

In dealing with the distortions in the financial sector as a result of the control system, the Economic Recovery Programme (ERP) was adopted in 1983 to ease up the economy and by extension the financial sector. The government of Ghana in 1983 embarked on the ERP after determining the macro economic framework jointly with the World Bank and International Monetary Fund (IMF). The ERP had the following objectives: to liberate the economy from state controls and market distortions, promote a liberalized private –sector led economic growth strategy and the restructure of the public sector of the economy in improving the prospect of growth Akuoko, (2000).

The ERP was accomplished in three phases spanning from 1983-1993. The first phase was centered on stabilizing the economy through the reduction of severe imbalances in government finances, reducing credit expansion and boosting productive activities from 1983-1986.

The second phase was called Structural Adjustment Programme (SAP) covered the period of 1987-1989 sought to rehabilitate the economy by tackling structural

imbalance through removal of major bottlenecks in the economy and laying the foundation for sustained growth.

The third and final phase also centered on the accelerated structural and institutional reforms by laying a foundation which is strong for growth of the private sector through the Financial Sector Adjustment Programme (FINSAP). The FINSAP was also executed in two (2) stages, FINAP I (1989-1990) and FINSAP (1991-1993). The FINSAP concept had an extensive objective of improving sound banking system through improved and supervisory framework and to improve the mobilization and allocation of financial resources including development of money and capital markets. Again it was also tasked to enhance the effectiveness of a broad range of non-banking financial institutions.

Debrah (1998), saw the passing of the Financial Institutions (Non-banking) law in 1993, with the aim of providing a legal framework for a whole new set of financial institutions that were being established. The institutions include discount houses, finance houses, acceptance houses, mortgage finance, hire purchase, building societies, savings and loans, leasing companies and venture capital companies.

In general, the Non-Banking Financial Institution (NBFI) consists of all financial institutions with the exception of banks which take part in the financial intermediation process. It also include securities institutions such as the Ghana Stock Exchange and its licensed dealing members, collective investments institutions such as unit trusts and mutual funds and contractual financial institutions as insurance companies and pension funds.

NBFIs had two (2) broad categories; that is deposit taking institutions and those that do not take deposit (non deposit taking institutions) directly from the general public.



In recent years Ghana's financial sector has experienced some tremendous strides in growth, this has led to a corresponding increase in the number of businesses and firms offering financial services.

The banking sector continued to experience strong regulation and supervision and the development of modern payments and settlement system after FINSAP II. Notable is the Bank of Ghana payment systems development strategy focused at delivery of financial services to deepen financial intermediation through the development of electronic payment products such as ATM services, transfer of funds at point of sale, e-money, internet and telephone banking. E-zwich was recently introduced with the aim of providing a common platform to help connect the various banking and institutions with a biometric smartcard (Acquah, 2009).

The banking sector has been the formal mode of financial intermediation in Ghana. There is however the need to make use of all available resources to ensure that financial resources which are currently not netted in the banking sector can effectively be attracted into the NBFIs sector. This will enable the NBFIs to supplement the banking institutions in directing the resources available to investment opportunities for the creation of jobs and expand both private and public sector trade and investment.

## **2.8 Financial Sector Reforms and Financial Sector Development**

High inflationary rate was one of the reasons for the implementation of the financial sector reforms in Ghana. This policy saw the liberalization of interest rate being given a crucial part in the sequencing of the measures of the reform, largely to transfer capital to its most prolific uses. It is also to serve as a motivation for the mobilization of deposits into the banking system. Due to the pitiable state of the economy, the

repressive financial policies had culminated in deterioration in the share of bank deposits in bank balance sheets, especially time deposit. However the use of cash for the payments of goods and services was strengthened.

The accumulation of financial assets faster than non-financial assets is one the emphasis of the development of the financial sector (Shaw 1973: vii). It also talk about the growth of the financial system in terms of size and the capacity of intermediation of the economy. Financial sector development is also associated with the circumvention of negative real interest rates by way of giving incentives to the income surplus unit and the income deficit unit. The measurement of financial sector development is normally done through the use of share of liquid assets in national output, normally some monetary aggregate/GDP ratio such as M2/GDP. An increase in financial savings is an indication of growth in M2/GDP.

The introduction of the financial reforms brought about some effectiveness in the financial sector. The effectiveness of the reforms was assessed by the implementation of the ratios of money reserve to total deposits and quasi-money. With the progress of the effectiveness of the financial reforms, these two (2) indicators were anticipated to drop. In the implementation of the reforms, banks were expected to become more efficient in terms of better assets management of the banks. Subsequently this will results in lower reserves as banks tries to reduce their holdings of excess reserves. These two variables incorporate the influence of reductions in the currency deposit ratio as the reform progresses. Improvements in financial intermediation are also anticipated to encourage the alteration of monetary holdings away from cash to deposits by non-banking sector. These opinions are however reliant on simultaneous improvements in the macroeconomic environment.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter defines the research methods used in conduct the study. The researcher explained how the data and information collected addresses the research objectives, questions and hypothesis. This chapter also discusses the data collection, the various research designs, description of variables and data analysis.

#### **3.2 Research Design**

According to Heppner et al, (2010) the research design describes the structure for an investigation and procedures for conducting and controlling a research study. It can also be described as the master plan of the methods as the master plan of methods and procedures that should be used to collect and analyze data.

Moreover, Saunders et al, (2003) stated that research design is deliberately planned arrangement of conditions for the analysis and collection of data in a manner that aims to combine relevance to research purpose with the economy procedure.

There are different types of research design, these are descriptive, exploratory and causal research designs. This study however uses causal research design.

#### **3.3 Causal (Explanatory) Research Design**

Causal research also known as explanatory research is conducted in order to identify the extent and nature of cause and effect relationship. Causal research can be done with the focal goal being to assess the impacts of specific changes on existing norms, and various processes. It focuses on the analysis of a situation or a specific problem to explain patterns and relationships between variables. This study falls under this design

and will use this design to examine the impact of inflation and interest rates on financial sector development in Ghana.

### 3.4 Data Collection Tool

The study employed secondary source of data. The use of secondary data enables the researcher to identify the problem, develop an approach to the problem and also formulate appropriate research design. Again secondary data was used in this study as it has the advantages of methodology, and research can contribute to this study by creation of new knowledge (Creswell, 2009). The data of the study was limited to the period of 1980-2015. The choice of the study period is dependent on data availability on most of the variables used in the study. The data is drawn from the World Bank's World Development Indicators, 2004 (CD-ROM) and African Development Indicators (various issues), IMF's International Financial Statistics CDRom (various issues), Quarterly Digest of Statistics of the Bank of Ghana and the Ghana Statistical Services Department, Global Development Network database, Penn World Tables and The State of the Ghanaian Economy by ISSER (various issues).

### 3.5 Model Specification

In this study, time series data are used to examine the impact of inflation and interest rates on financial sector development from the period of 1980-2015. The model is specified as;

$$FSD_t = \beta_0 + \beta_1 Infl_t + \beta_2 Exrate_t + \beta_3 Gdppc_t + \beta_4 Technology_t + \beta_5 Trgdp_t + \beta_6 Int_t + \beta_7 Gov_t + \varepsilon_t$$

.....1

Where;

*Infl* = inflation

*Exrate* = exchange rate

*Gdppc*=gdp pc

*Trgdp* = Trade (% of GDP)

*Int* = interest rate

*Gov* = government expenditure/borrowing

$\beta_0$  is constant and  $\beta_s$  (betas) are coefficients of specified macroeconomic variables while the error term is  $\varepsilon_t$  and defined as the residual error of the regression.

Equation 1 is a static model. Therefore the study modifies it to a dynamic model as follows;

$$FSD_t = \beta_0 + \beta_1 \Delta Infl_t + \beta_2 \Delta Exrate_t + \beta_3 \Delta Gdppc_t + \beta_4 \Delta Technology_t + \beta_5 \Delta Trgdp_t + \beta_6 \Delta Int_t + \beta_7 \Delta Gov_t + \varepsilon_t$$

.....2

The dynamic model is used because the static model assumes a contemporaneous effect there independent variables have on the dependent which is a strong assumption, hence the use of the model.

**Table 3.1 Measurement of Variables**

<b>VARIABLE</b>	<b>DESCRIPTION</b>	<b>MEASUREMENT</b>
<b>Bank Private Credit</b>	Dependent	Advances to the private sector in billions of Ghana cedis.
<b>Inflation rate</b>	Independent	Annual percentage of consumer price index.
<b>Interest rate</b>	Independent	Annual percentage rate.
<b>Exchange rate</b>	Control variable	Foreign exchange market.
<b>Trade openness</b>	Control variable	Sum of imports and exports measured in billions of US dollars.
<b>Government expenditure</b>	Control variable	Government expenditure to GDP.
<b>GDP per capita income</b>	Control variable	Total GDP. Total population

### **3.6 Data Analysis**

The study used dynamic OLS regression technique for analyzing the data. Regression analysis is used when a researcher is interested in finding out whether an independent variable predicts a given dependent variable. Dynamic OLS attempts to determine a group of variables together to predict a given dependent variable. The collected data was edited for consistency, accuracy, uniformity and completeness and tabulated before analysis was carried out. Given that this was a causal design analysis of the impact of inflation and interest rates on financial sector development. Again this study will use tables and graphs to give more clarity of the study. Eviews will be used to examine the influence of the dependent variable on the interdependent variables.

### **3.7 Dynamic OLS**

Ordinary least square (OLS) is one of the methods used for estimating the unknown parameters in a linear regression model. OLS chooses parameters of a linear function of a set of explanatory variables by the principle of least squares, thus minimizing the sum of squares of the differences between the observed dependent values in the given database and those predicted by the linear function.

OLS is consistent with the regressors and exogenous, and optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated.

Under these conditions, the OLS method gives a minimum variance mean-unbiased estimation when the errors have finite variances. Under the additional assumption that the errors are normally distributed, OLS is the maximum likelihood.

The use of OLS in analyzing time series data comes with its own shortfalls; the following are some of the problems in using least square regression;

**Presence of outliers:** OLS portrays inefficiency when some point in the data has excessively larger or smaller values for the dependent variable as compared to the remaining data. This makes inferences from such data wrong, as outliers can wreak havoc on the accuracy of prediction.

**Wrong choice of features:** The challenge in picking the right explanatory variables for forecasting a problem is one that plagues all regression techniques. It is important to carefully select variables that will be used the regression algorithm, including those features that are more likely to have a strong effect on the dependent variable and exempting variables that are unlikely to have much effect.

### **3.8 Diagnostic Test**

Before the application of OLS, some diagnostic test is carried out to examine the validity of the OLS assumption. The following tests were conducted.

#### **3.8.1 Normality Test**

One of the assumptions of Classical Linear Regression Model (CLRM) is that the errors are normally distributed. This test is carried out by using Jarque-Bera test. If the

test statistics is significant, the null hypothesis is rejected, meaning the errors are normally distributed.

### 3.8.2 Multicollinearity Test

If there exist a relationship between the explanatory variables, then there exist multicollinearity. However, if severe then there is an exact multicollinearity which means one variable completely explain another variable. Thus the study used Variance inflation factor (VIF). If the VIF is below five (5), there is the absence of multicollinearity.

### 3.8.3 Heteroscedasticity

Heteroscedasticity occurs when the variance of the error is not constant thus where

$$\text{Var}(u_i) = \sigma_i^2 \dots\dots\dots 3$$

However, homoscedasticity is where the variance is constant, thus where

$$\text{Var}(u_i) = \sigma^2 \dots\dots\dots 4$$

The presence of heteroscedasticity makes OLS result unbiased and consistent but they are not BLUE. Meaning the standard errors could be inappropriate and thus any inference made could be misleading. In this study, Breusch – Pagan test was used. And if the probability value is statistically significant, the null hypothesis is not rejected. Meaning the model is homoscedastic.



#### **3.8.4 Autocorrelation Test**

Another important assumption of CLRM is that the errors must not be correlated.

Thus

$$\text{Cov}(u_i, u_j) = 0 \text{ where } i \neq j.$$

Again Breusch Pagan test was used. If the probability value is statistically significant, the null hypothesis is not rejected. Meaning there is no autocorrelation in the model.

#### **3.8.5 Stationarity Test**

To test for stationarity of the model, CUSUM/CUSUM<sup>2</sup> was conducted and the graph lies in the band, it implies that there is stationarity in the model.

### **3.9 Measures of Financial Development**

The measurement of financial development is crucial in evaluating the progress of financial development and understanding the corresponding impact on economic growth and reduction of poverty. Based on the existing literature, studies on financial development in different countries often used proxies to show the development of the financial system. As a result of this, specific characteristics of any financial system, various indicators have been proposed to measure financial development. Selected indicators depend on the size, efficiency and relative importance of financial intermediaries (Choong and Chan 2011).

However the measurement of financial development is difficult in practice given the complexity and dimensions it compasses. Since the financial sector of a country comprises a variety of financial institutions, markets and products, these measures only serve as a rough estimate and do not fully capture all aspects of financial development. Financial sector development can be measured by several indicators,

however Mahawiya (2015), gave a comprehensive set of measures for FSD to quantify the development, structure and performance of financial sector. They include ratio of bank assets to the sum of bank assets and central bank assets (dm<sub>ba</sub>), financial depth (M3 per GDP) and bank private credit to GDP (pcr). This study will use bank private credit to the private sector as a proxy of FSD

### **3.9.1 Bank Private Credit to the Private Sector (Pcr)**

This measure talks about the credit facility made available by the commercial banks and other financial institutions to the private sector to GDP which forms the greater proportion of the population. This indicator is denoted by *PCR*. This credit does not include the credit the central government takes from the domestic commercial banks to undertake projects and fulfilling other social obligations they may deem necessary (Levine, Loayza and Beck, 2000). It is focused on the acquired savings that are geared towards productivity in the form of enabling the private sector which is the engine of growth and have financial constraints to have access to credit. These credits are given under flexible terms and condition as against credit to the public sector which is driven by profit motives (Levine and Zerros, 1998).

### **3.9.2 The Ratio of Bank Assets to the sum of Bank Assets and Central Bank Assets (dm<sub>ba</sub>)**

This measure portrays the kind of impact commercial banks exert on the financial sector in the economy, since the financial sector in Ghana is dominated by the banking sector. The influence of the central bank assumes a downward turn as the assets of the bank increases. This measure is important to this study as commercial banks are presumed to perform all the functions of the financial system.

### **3.9.3 Financial Depth or M3/GDP**

M3/GDP is preferred to M2/GDP because M2/GDP is found in M3/GDP. Another reason is that M2/GDP is under the criticism that an increase in M2/GDP may not necessarily reflect an increase in bank deposits but rather monetization. M3/GDP on the other hand presents sufficient direct information on the level of financial intermediation.

More to that, credits provided by nonbanking financial sector such as the microfinance institutions are also important since it augments the credit needs of the real sector. Despite its importance, this variable is not considered as there is no consistent data on this variable.

However bank private credit to the private sector is used as proxy for FSD for this study because as the private sector has access to credit, new businesses can be set up and those at the verge of collapsing can be revived and other forms of investments can also be endeavoured into. Levine et al (2000), posit that an increase in bank private credit to the private sector indicates a higher level of financial services and by extension greater financial intermediary development.

### **3.10 Description of Key Variables in the Model**

The relevance of understanding the macroeconomic determinants of financial development lies in the fact that a more active financial sector is of great importance for economic growth. The key variables identified in this are financial sector development, inflation, interest rate, exchange rate, trade, government expenditure, GDP pc.

### **3.10.1 Inflation**

Inflation refers to the rate of change in the average prices of goods and services typically purchased by consumers. If inflation is low and stable, then we say that there is price stability.

World Bank (2011) defines inflation as ‘a sustained increase in the general prices level of goods and services. Inflation is typically defined as the annual percentage change in the Consumer Price Index (CPI). The CPI represents the average price of a standard basket of goods and services consumed by a typical by people in a country for a given period. This standard basket contains hundreds of consumption items (such as food products, clothing, water and electricity) whose price movements are monitored to determine the change in the CPI, or the level of inflation.

This variable is important to this study because it affects the investment decisions of individuals and corporate bodies in the economy. Future worth of their monies and investment plays a key role in the allocation of resources.

### **3.10.2 Trade Openness (% of GDP)**

It is the sum of exports and imports of goods and services measured as a percentage of Gross Domestic Product. It measures the openness or integration of a country in the world of economies. With the advent of globalization more countries are increasingly embracing trade liberalization which has been empirically demonstrated to have positive effect on financial sector development. This indicator accounts for the total representation of the combined weight of total trade in the economy which is a measurement of the level of reliance of domestic producers on markets in the foreign

economies and the degree of reliance of domestic demand on foreign supply of goods and services. The variable is relevant to this study because it induces a positive and statistically significant relationship with FSD (Baltagi et. al 2009).

### **3.10.3 Per Capita Income**

This is GDP per capita which is measured as the ratio of gross domestic product to total population and is an indicator of a country's standard of living. A higher per capita level in the form of increase in income level is an indication of high standard of living which is expected to induce development in the financial sector. This variable was considered because of its positive effect on the growth of the economy.

### **3.10.4 Interest Rate**

This is measured using the prime rate. The prime rate is the annualized interest rate the central bank charges commercial, depository banks for loans to meet temporary shortages of funds. High prime rate restricts the supply of bank lending in the sense that the banks are unable to borrow large sums of money to be lend to the private sector so as to augment the services of financial intermediaries. On the other hand, low interest rate is beneficial for enhancing the activities of financial intermediaries to promote development in the financial sector. This indicator was used because of the importance the surplus unit and deficit place on cost of capital and rate of return.

### **3.10.5 Government Expenditure**

This is the domestic credit extended to the central government by the financial institutions. It is measured as credit to the government as a percentage of Gross Domestic Product. In the developed economies debts of government are usually

securities which form the greater proportion of the government expenditure. A high government borrowing has the potential of crowding out the private sector credit. This is relevant to this study as this Variable ascertain the resource which has been transferred to the central government.

### **3.10.6 Exchange Rate**

Olweny and Omandi (2011), defines exchange rate as the price paid for a country's currency in relation to another country's currency. Exchange rate volatility is very important in relation to rate of returns to foreign investors who invest in the local market and domestic investors who tend to invest in the foreign market. Exchange rate management is one of the conventional methods to alleviate internal and external imbalances of the economy. Aghion et al (2009), is with the explanation that the anticipation of the fluctuations of the exchange rate would discourage innovation which would in turn decrease the growth of a country if the level of financial development is thin.

This indicator is relevant to this study because most of the local businesses use foreign currency in relation to the local currency to transact business especially in the procurement of raw materials.

### **3.10.7 Technological Prowess**

Technological prowess in financial sector is the use of technology in rendering financial services to individuals and firms. With technology, a small firm in possession of communication and processing services from others can penetrate a market and compete with firms which are bigger than them, hence reducing entry

barriers in markets. Processing of information and communication technologies are employed to improve existing services and also for the implementation of new ones to make them available in new ways. This variable was considered because the usage of technologies needs huge sums of capital, and this can be easily acquired in a well-developed financial system.

## **CHAPTER FOUR**

### **PRESENTATION OF DATA, ANALYSIS AND DISCUSSION**

#### **4.1 Introduction**

This chapter describes the analysis of data and discussion of the research findings. The data is analyzed to describe the impact of inflation and interest rates on financial sector development in Ghana. The study employed the use of time series generated annually from Ghana from 1980-2015. The data was gotten from the World Bank's World Development Indicators and African Development Indicators (various issues), IMF's International Financial Statistics CDROM (various issues), Quarterly Digest of Statistics of the Bank of Ghana and the Ghana Statistical Services Department, Global Development Network database, Penn World Tables and The State of the Ghanaian Economy by ISSER. To analyze these data series, the dynamic OLS was employed. The dynamic OLS is used to examine and investigate the linkage between inflation and financial sector development (FSD).

#### **4.2 Description Statistics**

Descriptive statistics are conducted to help the researcher understand the nature and behavior of data. The summary statistics applied in this study include the mean, standard deviation, minimum, and maximum. The mean is a measure of central tendency which represents the average of a variable for the period under study. The standard deviation on the other hand measures how an observation deviates from the mean or expected value. A high standard deviation shows how volatile a variable is or how widely spread out the values are in large range around the mean, a smaller standard deviation value on the other hand shows how close the values are to the mean. Kurtosis measures the peakness and flatness of the distribution of the series.



From the figure 4.1 below bank private credit to the private sector (PCR) recorded an average of 9.277 and a standard deviation of 5.702. FSD assumed a poor performance within the period under review comparing the figures of the maximum and minimum which are 19.368 and 1.542 respectively. A possible cause could be the presence of outliers. The huge range coefficient of 17.8260 indicates uncertainty nature in FSD. This means FSD is very volatile and very difficult to predict the mean. This problem can be solved by differencing the data.

A variable of interest; inflation recorded a mean and standard deviation of 28.056 and 26.480 respectively, making it more volatile and uncertain than FSD. It also recorded maximum and minimum values of 122.875 and 8.727. The huge standard deviation confirms the volatile nature of inflation in Ghana within the period under review. A comparison between the mean, minimum, maximum and standard deviation portrays that the observations for inflation are more skewed towards the minimum than the maximum making estimation difficult.

**Table 4.1 Descriptive Statistics**

	<b>PCR</b>	<b>EXRATE</b>	<b>GDPPC</b>	<b>GOV</b>	<b>INFL</b>	<b>INT</b>	<b>TRGDP</b>
Mean	9.277	0.501	799.547	10.280	28.056	17.565	65.095
Median	10.112	0.184	732.276	9.811	18.641	15.375	70.554
Maximum	19.368	1.954	1295.629	15.308	122.875	35.759	116.048
Minimum	1.542	0.000	532.664	5.861	8.727	8.885	6.320
Std. Dev.	5.702	0.596	219.193	2.242	26.480	7.827	30.891
Skewness	0.068	0.950	1.026	0.222	2.533	0.975	-0.400
Kurtosis	1.540	2.688	3.017	2.677	9.175	2.776	2.117
Jarque-Bera	3.045	5.254	5.966	0.426	90.391	5.457	2.014
Probability	0.218	0.072	0.051	0.808	0.000	0.065	0.365
Observations	34	34	34	34	34	34	34

Source; Author's construct, 2018

Another variable of interest; interest rate recorded an average of 17.565 and a standard deviation of 7.827, showing volatility and uncertainty in interest rate in Ghana. A possible cause could be the presence of outliers hence making inference and predictability of the mean wrong and difficult respectively. Thus, interest rates for the most of the years are more skewed towards the minimum than the maximum.

Other control variables like exchange rate recorded a mean and standard deviation of 0.501 and 0.596 respectively. It also recorded a minimum of 0.000 and a maximum of 1.954. GDP per capita indicated a mean and standard deviation of 799.547 and 219.193 respectively whilst its maximum and minimum was 532.664 and 1295.629 respectively.

Government expenditure had a mean of 10.280 and a standard deviation of 2.242 with a maximum and minimum of 15.308 and 5.861 respectively. Trade GDP had a mean and standard deviation of 65.095 and 30.891 respectively with its minimum and maximum being 6.320 and 116.048 respectively

#### **4.3 Diagnostic Test**

As already mentioned in chapter 3 section 3.7, some diagnostic tests were carried out and they are discussed below.

Diagnostic tests conducted included the autocorrelation test, heteroscedasticity test, normality test, stability test, and multicollinearity test. The test results are displayed in the table below.

As depicted in the table 4.3, autocorrelation test was conducted using the Breusch-Godfrey test. Since the probability value of 0.2639 which is greater than 5%, the null

hypothesis of no autocorrelation cannot be rejected. Hence, it can be concluded that there is no autocorrelation.

**Table 4.2 Diagnostic Test Results**

Type of test	Method	P-value	Remarks
<b>Normality</b>	Jarque-Bera	0.934611	Normally distributed
<b>Autocorrelation</b>	Breusch Godfrey	0.263917	No autocorrelation
<b>Heteroscedasticity</b>	Breusch-Pagan	0.022297	Heteroscedasticity
<b>Multicollinearity</b>	VIF	VIFs < 1	No multicollinearity
<b>Stability</b>	Cusum/cusum <sup>2</sup>	Stable	Stable

Again, the Breusch-Pagan-Godfrey test recorded probability value of 0.0223 which is lesser than 5% and thus, the null hypothesis of homoscedasticity is rejected. In other words, there is the absence of heteroscedasticity. For the normal distribution of the errors as shown by the Jarque-Bera test which suggests that the errors are normally distributed. The variance inflation factors were also lower than ten, hence the absence of multicollinearity. The test results are displayed in appendix A.

#### **4.4 Analysis of Results**

Table 4.3 below describes the relationship between FSD as the dependent variable as against the independent variables of exchange rate, Gross Domestic Product Per Capita, government expenditure, inflation, interest rate, trade (% of GDP) and technological advancement. The adjusted R-square from the table indicates that, 34.0% of the variation in FSD are explained by inflation, interest rate, exchange rate,

GDP per capita, government expenditure technological prowess and trade/ GDP. However the R square is 49%.

From the table, inflation had a coefficient of -0.008 and a probability value of 0.230. A percentage increase in inflation will not cause a change in FSD all things being equal. Per the figures, inflation has a negative and statistically insignificant relationship with FSD. This means FSD may be irresponsive or insensitive to changes in inflation. The insignificant inflation coefficient may also suggest a non-linear relationship between FSD and inflation.

Studies such as Mahawiya (2015), Boyd et al. (2001), and Khan et al (2001) suggest that there is a non-linear relationship between inflation and FSD. This means that inflation will be detrimental to FSD only when it reaches certain magnitude before its negative effect can be felt.

The increase and decrease effects of inflation on FSD will not change the portfolio of FSD due to its insignificant nature. Inflation is not statistically significant because the probability value is 23% suggesting that inflation rate does not significantly impact FSD irrespective of its movement. Again it means that the development and underdevelopment of the financial sector in Ghana for the period under review has insignificant relationship with inflation. Inflation rate can record its all time high or low values, these figures will not have any significant effect on the development of the financial sector in Ghana. However it shows its theoretically expected sign of negative. What this means is that an increase in inflation by 1% will result in a decrease in FSD in Ghana by 0.008%. However the coefficient is not significant so one cannot put emphasis on it.

**Table 4.3 Results of FSD**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$\Delta Exrate_t$	-1.719	0.673	-2.553	0.017
$\Delta Gdppc_t$	0.002	0.006	0.332	0.743
$\Delta Gov_t$	-0.269	0.114	-2.364	0.027
$\Delta Infl_t$	-0.008	0.007	-1.231	0.23
$\Delta Int$	-0.135	0.056	-2.393	0.025
$\Delta Trgdp_t$	0.088	0.022	3.986	0.001
$\Delta Technology_t$	-0.096	0.047	-2.028	0.054
C	0.307	0.242	1.268	0.217
<hr/>				
R-squared	0.49			
Adjusted R-squared	0.342			
Prob(F-statistic)	0.013			
Durbin-Watson stat	2.397			

The result is not in line with McKinnon (1991) study which assumes that the stability of the price is crucial for financial intermediation and that high inflation rates deter long term contracting, aggravates informational asymmetry and moral hazard and that inflation impede financial development. Again inflationary environment deteriorates financial institutions by reducing money supply and restricting financial resources for investment projects. This reduces their liquidity ratio hence reducing credit availability.

Also this result does not corroborate the studies from Boyd et al. (2000), Adhiambo (2012), Al- Nasser et al. (2012), and Ghazouni (2005) Huang et al (2010), Bittercourt (2008) and English (1999). They all expressed a negative significant relationship between inflation and FSD.

Another variable of interest which is interest rate, had a coefficient estimate of -0.135 and probability value of 0.025. Interest rate also exhibits a negative and statistically significant relationship with FSD. A 1 % increase in interest rate will attract 0.135% decrease in FSD.

On the other hand a 1% decrease in interest rate will also increase FSD by a margin of 0.135%. Thus interest rate has had an adverse significant effect on financial sector development in the Ghanaian economy over the period under study. This means FSD is responsive and sensitive to interest rate changes. This also means that for the period under review the upward and downward movement of interest rate has a significant impact on the development of the financial sector. High interest rate reduces demand for loans (Gilchris, 2013). Interest rate is the price a borrower pays for the use of money they borrow from an individual lenders or financial institutions. When interest rates are high, financial savings are made more attractive and economic agents find it more rewarding to transfer their savings from other forms of savings to financial saving.

On the other hand, under low interest rate, investment behaviour is affected as the income surplus unit becomes unwilling and discouraged to give out financial resources to the income deficient unit to undertake productive ventures as price to be paid cannot compensate for their risk taken. This situation rather motivates individuals and institutions to access loans. In other words, if these financial instruments such as shares, mutual funds, postal savings and pension funds are made more attractive, it is likely that economic agents may reallocate their savings in favour of these assets, just that such reallocation may have no impact on the value of the total savings (Gupta, 1984; Mahambare and Balasubramanyam, 2000).

At low income levels, which have been the situation in Ghana for all these years, high interest rates are unlikely to stimulate savings because the totality of incomes will be devoted to consumption rather than savings. When income is low especially during economic downturn, even if a high deposit rate is sustained, savings will not increase unless income rises beyond consumption level.

A decrease interest rate as a general rule is conducive for economic environment since consumers and the corporate bodies can afford to borrow funds and pay little price for the funds borrowed.

The Keynes's Liquidity preference theory of interest rate supports this finding. The theory states that one of the reasons firms, individuals keep portion of their money is speculative reasons. If people anticipate a rise in the rate of interest in the future, they will as much as possible try to hold money in cash in order to lend it in the future.

This means a future expectation will make the surplus unit for example not willing to release funds to the deficit units to undertake investments as the expected rate of return that will be paid by the deficit units now will be low as compared to what will be paid when interest rate is high, hence reducing credit availability.

Alternatively if one expects a fall in the rate of interest, one will immediately like to invest money now in order to avail themselves of the advantages of high rate of interest. This will also serve as encouragement to the deficit unit to borrow more as the expected price to be paid will fall. The surplus unit on the other hand will be willing to release funds to deficit now than holding on to their funds as the expected price to be paid for the borrowing will fall in the future, thus increasing credit availability. Thus an expected increase in the rate of interest induces liquidity preference and an expected decrease has the opposite effect.

The finding also corroborate the theory of credit rationing which state that high interest rate may result in adverse selection and moral hazard problems for the borrowers.

Adverse selection problem occurs as a result of diverse borrowers having different possibilities of loan repayment. The projected return to the banks is also reliant on the likelihood of loan repayment. As a result of this, banks are faced the problem of distinguishing “good borrowers” from the bad ones employing a variety of screening devices. The willingness of a borrower to pay a certain level of interest rate is considered as one of the screening devices to detect prospective borrowers with a high possibility of repayment.

Stiglitz and Weiss (1981) are with the view that individuals who are willing to take up loans which are associated with high interest rates on the average are worse defaulters. They are prepared to borrow at high interest rates because they recognize that their probability of repaying the loan is less. The profits of the banks are negatively affected as increases in the rate of interest rate increases the riskiness of borrowers.

Again, less risky projects may become unbeneficial and serve as a threat to loan repayment as a result of interest rate being high. In addition, as a result of high interest rates, consideration is given to borrowers with high yielding risky projects because the related high probability of not paying accordingly impends the capital base of the banks. Hence in dealing with the minimization of the risk, banks are advised to give out loans at a comparatively lower rate than the market rate. This rearrangement of loan assortments therefore suggests that the interest rate machinery



will be incapable of accomplishing market rate equilibrium, and credit rationing may be used to allot funds.

Changing the behaviour of borrowers is another way interest rate affects the banks projected return from a loan. Moral hazards problem happens because it is exorbitantly expensive for the banks to successfully monitor the behaviour of borrowers after loans have been given out to them. Therefore banks have to consider the effect of interest rate on the behaviour of borrowers. However increasing rate of interest increases the comparative desirability of riskier projects encouraging firms to divert approved funds to finance only high yielding projects. The high risk connected to these high yielding projects would aim at affecting the probability of loan repayment and accordingly reduce the profitability of the banks. Thus the moral hazard occurrence may persuade lenders to ration credit rather than increase the interest rate when there is a surplus demand for loanable funds.

The result confirm the findings of the following studies. Masson et al (1998), Galac and Kraft (2000), Nganga and Wanyoike (2017) and Gull and Zaman (2013). Their findings established a negative relationship between FSD and interest rate.

On the other hand there were contrasting views from Ologunde (2006), Akbar, Ali and Khan (2012), Ojeaga and Odejimi (2013). They expressed a positive relationship between the two variables.

However Lagat and Okendo (2016) were with a completely different view of positive insignificant relationship between the two variables.

Exchange rate also has a coefficient value of -1.719 and a probability value of 0.017. This implies a negative relationship with FSD which is also statistically significant,

since exchange rate has a P value of 0.017 which is less than 0.05. This signifies that FSD is responsive to exchange rate movement since a unit increase in exchange rate will induce 1.719 decreases in FSD. On the other hand a unit decrease in exchange rate will also induce 1.719 increases in FSD. Thus exchange rate has adverse effect on financial development in the Ghanaian economy.

The table portrays a positive and significant relationship between FSD and trade/GDP. This means increase in trade openness has the potential of stimulating financial development in Ghana over the period under study. It also means FSD is sensitive to Trade/ GDP since a unit increase in trade will attract a corresponding increase in FSD. This positive effect of trade openness on financial sector lends support to the argument by Rajan and Zingales (2003), Law Demetriades (2006), 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 and that financial development promote competition when a country opens bothers to both trade and capital inflows.

Government expenditure coefficient exhibits a negative and statistically significant relationship with FSD. This result means that government borrowing does crowd out the private sector credit to lead to a decline in financial development in Ghana. Studies from Shale and Subika (2008), Demetriades and Rousseau (2010) expressed that government borrowing from the banking sector may crowd out private credit. However, studies from Emran and Subika (2009, pp.4), revealed otherwise that government borrowing from the banking sector may not crowd out private credit.

The coefficient of technology is negative and statistically significant with FSD. This means technology have adverse effect on financial sector development under the

study period. However this is counter intuitive, meaning it does not make economic sense. This is due to data problem.

Finally, the coefficient of GDP per capita also had positive effect on financial development and is statistically insignificant. It also posit that FSD is insensitive to GDP per capita. One of the reasons which can be attributed to the insignificant result may be that the income levels in Ghana are very low hence their inability to save hence not contributing positively to the development of financial sector. It is the notion that increasing level of income encourages the use of financial institutions and claims; therefore growth in income per head is important for financial development.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Overview of the Study**

This research sought to examine the impact of inflation and interest rates on the financial sector development. The Ghanaian financial sector has witnessed several challenges including the collapse of several micro finance institutions and a number of banks in most recent times. This may be caused by the behavior of some macroeconomic variables. In an attempt to understand some of the possible causes, the researcher examined the effects of inflation and interest rates on the financial sector using data from the world development indicators spanning from 1980 to 2015. The data was analyzed using the Dynamic OLS (DOLS). Section 5.2 below summarizes the findings.

#### **5.2 Summary of Findings**

The study examined the impact of inflation and interest rates on FSD in Ghana for the period of 1980-2015. This was in line with theoretical inconsistencies as to whether effective financial intermediation could be undertaken at relatively high or low inflation and interest rates. Though these propositions are supported by a number of empirical evidences which sound great, the evidence in Ghana appears mixed. While developments in the financial sector of Ghana in 1980's suggested that high inflation and interest rates were repressive to the financial sector (disrupting effective financial intermediation), recent developments in the 2000's still suggest that inflation and interest rates are too high for effective financial intermediation, though the rates appear to be relatively lower than they were some two decades ago. So what are the impacts of inflation and interest rates on FSD in Ghana?

In answering this question, Dynamic OLS was developed and estimated. Diagnostic test was carried out to ensure the model satisfy the assumptions of the estimation techniques selected.

The results from the estimated econometric model showed a negative insignificant effect of inflation on financial sector development, FSD is insensitive to inflationary rate. Interest rate on the other exhibited a negative and significant relationship with FSD. The other control variables; exchange rate, and government expenditure and technological prowess are statistically significant. They all recorded a negative effect with FSD. Trade/GDP also recorded a positive effect with FSD. GDP pc was not statistically significant. The R squared was 49% and the adjusted R squared was 34%. This also means that 34% of the variations in the financial sector development are explained by inflation, interest rate, exchange rate, government expenditure, trade/GDP, GDP pc, and technological prowess.

### **5.3 Conclusion**

The results obtained from the model shows that there is a negative and insignificant relationship between inflation and FSD. Meaning FSD is insensitive to inflation rate. The findings did not support studies such as Boyd et al. (2000), Adhiambo (2012), Al-Nasser et al. (2012), and Ghazouni (2005) Huang et al (2010), Bittercourt (2008) and English (1999). They all expressed a negative significant relationship between inflation and FSD.

Again, the result also indicated a negative and significant relationship between FSD and interest rate. This implies that an increase in interest rate will result in a decrease in FSD and vice versa. The result corroborate with the studies such as Masson et al (1998), Galac and Kraft (2000), Nganga and Wanyoike (2017) and Gull and Zaman

(2013). Their findings established a negative relationship between FSD and interest rate. It also confirms the Keynes's liquidity preference theory of interest rate.

Other studies such as Ologunde (2006), Akbar, Ali and Khan (2012), Ojeaga and Odejimi (2013) expressed a positive relationship between the two variables.

However Lagat and Okendo (2016) were with a completely different view of positive insignificant relationship between the two variables.

#### **5.4 Policy Recommendations**

Based on the findings above, the researcher made the following recommendations. Even though the study indicates that inflation has no statistical significant effect on the development of financial sector, the policy recommendation however is that effort should be made to keep inflation low and stable since high inflation has detrimental effect on financial sector development. This can be achieved through policy makers encouraging the real sector to produce more goods and services to bring the prices down.

Again the monetary agencies should also ensure that interest rates in Ghana are low to induce the development of the financial sector. In Ghana, the banking sector forms the greater part of the financial sector. These banks partially depend on proceeds from the credit given out. Credit accessibility contributes positively to economic growth as this will enable firms and individuals to get additional funds to revamp and resurrect their business. This also increases job creation and invariably enabling them to fulfill their tax obligations.

Subsequently, income levels should be increased so that even in high interest rates, savings will still be induced since totality of their incomes will not be devoted to

consumption but rather some portion will be saved. This is very important because savings/deposits enable the banks in particular to increase their credit formation.

### **5.5 Areas for Further Research**

A strong financial system is very relevant in ensuring economic growth. A weak financial system may lead to economic failure. Based on the above, further studies may want to look at exploring the effect of bank failures on financial inclusion in Ghana. A study may be conducted on the determinants of non-performing loans. Another may be conducted on the effect of the policy rate on non-performing loans.

## REFERENCES

- Acquah, P.A., (2005). *The monetary policy setting in Ghana-issues and prospects. Modern Ghana.*
- Acquah, P.A., (2005). *Welcome remarks of a Bank of Ghana symposium. Accra.*
- Al-Nasser, O. and D. Jackson, (2012). *The impact of financial sector performance in Latin American countries. University of Texas-Pan American.*
- Apo, N., (2004). *Inflation and financial depth in Ghana. M.Sc. Thesis, University of Ghana.*
- Bencivenga, V., B. Smith and R. Starr, (1995) *Transaction costs, technological choice endogenous growth. J. Econ. Theory, 67: 153-117. DOI: 10.1006/jeth.1995.1069*
- Bencivenga, V.R. and B.D. Smith, (1992). *Deficits, inflation and the banking system in developing countries: The optimal degree of financial repression. Oxford Econ., 44: 767-790. BG, 2002. Act 612. ACCRA, Ghana.*
- BG, (2010). *Monetary policy report.*
- Bittencourt, M., (2008). *Inflation and financial development: Evidence from Brazil. UNU-WIDER.*
- Black, John (2002). *A Dictionary of Economics, New York: Oxford University Press, 2nd Edition. Durauf, N. Steven.*
- Blume, E. Laurence (2008). *The New Palgrave Dictionary of Economics, New York: Palgrave Macmillan, 2nd Edition, Volume 8*



- Boyd, J.H., B.D. Smith and R. Levine, (1996). *Inflation and financial market performance. Pennsylvania State University.*
- Boyd, J.M. and B.D. Smith, (1998). *Capital market imperfections in a monetary growth model. J. Econ. Theory*, 11: 241-273. DOI: 10.1007/s001990050187
- Boyd, J.M., R. Levine and B.D. Smith, (2001). *The impact of inflation on financial sector performance. J. Monet. Econ.*, 47: 221-248. DOI: 10.1016/S0304-3932(01)00049-6
- Caner, M. and B.E. Hansen, (2004). *Instrumental variable estimation of a threshold model. Econ. Theory*, 20: 813-843.
- English, B.W., (1998). *Inflation and financial market size. J. Monet. Econ.*
- Fischer, S., (1983). *Inflation and growth.* Cambridge.
- Fischer, S., (1996). *Why are central banks pursuing long run price stability?* J. Proc., 1: 7-34.
- Ghazouani, S., (2005). *Does inflation impact on financial sector performance in the MENA region?* Rev. Middle East Econ. Finance, 3: 48-58.
- Gockel, A.F. and S.K. Akoena, (2002). *Financial intermediation for the poor: Micro, small and medium scale enterprises in Ghana-A further assignment for financial sector policy?* IFLIP Research Paper No. 02-6, ILO Geneva.
- Greenspan, A., (1996). *Opening Remarks: Achieving Price Stability. Proceedings of the Opening Remarks on the Federal Reserve Bank of Kansas City Symposium Achieving Price Stability, (SAPS' 96).*

- Haslag, J. H. (1997). “*Output, Growth, Welfare and Inflation: A Survey*”, Economic Review Second Quarter, Federal Reserve Bank of Dallas.
- Huang, H.C., S.C. Lin and C.C. Yeh, (2010). *Inflation and the finance-growth nexus. Econ. Modell.*, 27: 229- 236. DOI: 10.1016/j.econmod.2009.09.003
- Huybens, E. and B. Smith, (1998). *Financial market frictions, monetary policy capital accumulation in a small open economy*. J. Econ. Theory, 81: 353-400. DOI: 10.1006/jeth.1997.2372.
- Huybens, E. and B.D. Smith, (1999). *Inflation, financial markets long-run real activity*. J. Monet. Econ., 43: 283-315. DOI: 10.1016/S0304-3932(98)00060-9.
- Johansen, S. and K. Juselius, (1990). *Maximum likelihood estimation and inference on cointegration-with applications to the demand for money*. Oxford Bull. Econ. Stati., 52: 169-210. DOI: 10.1111/j.1468- 0084.1990.mp52002003.x
- Keho, Y., (2009). *Inflation and financial development: Cointegration and causality analysis for the UEMOA Countries*. Int. Res. J. Finance Econ., 1: 118-123.
- Khan, M.S. and A.S. Senhadji, (2001). *Threshold effects in the relationship between inflation and growth*. IMF Staff Paper, 48: 1-21.
- Khan, M.S. and A.S. Senhadji, (2006). *Threshold effects in the relationship between inflation and growth*. Social Science Electronic Publishing, Inc.
- Khan, M.S., (2008). *Financial deepening, inflation and economic growth*. University of Basel.
- Khan, M.S., A.S. Senhadji and B.D. Smith, (2001). *Inflation and Financial Depth*. 1st Edn., International Monetary Fund, pp: 30.

- Kim, D., S. Lin and Y. Suen, (2010). *Dynamic relationship between inflation and financial development*. J. Econ. Litera., 14: 343-364.
- Lee, C.C. and S.Y. Wong, (2005). *Inflationary threshold effects in the relationship between financial development and economic growth: Evidence from Taiwan and Japan*. J. Econ. Dev., 30: 49-70.
- Levine, R., N. Loayza and T. Beck, (2000). *Financial intermediation and growth: Causality and causes*. J. Monet. Econ., 46: 31-77. DOI: 10.1016/S0304-3932(00)00017-9.
- Mahawiya (2015). *Financial sector development, inflation and openness: A comparable study of ECOWAS and SADC*. School of Economics, University of Cape Coast.
- Mahawiya, (2015). *Foreign inflows, financial sector development and economic growth in ECOWAS and SADC*. Doctorate Thesis, School of Economics, University of Cape Coast.
- McDonough, W.J., (1997). *A framework for the pursuit of price stability*. Econ. Policy Rev., 3: 1-7. McKinnon, R.I., 1973. *Money and capital in economic development*. 1st Edn., Washington, DC, Brookings Institution Press, ISBN-10: 0815756135, pp: 184.
- McKinnon, R.I., (1982). *The order of economic liberalization: Lessons from Chile and Argentina*. Carnegie-Rochester Conf. Series Public Policy, 17: 159-186.
- Meltzer, T.C., (1997). *To conclude: Keep inflation low and, in principle, eliminate it*. Louis Q. Rev., 79: 3-8.

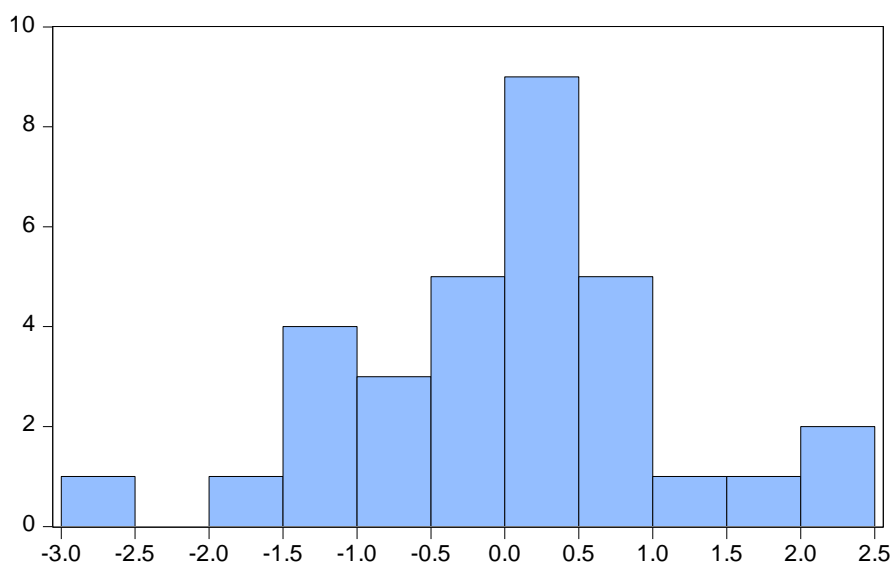
- Papademos, L., (2006). *Price stability, financial stability and efficiency and monetary policy*. Proceedings of the 3rd Conference of the Monetary Stability Foundation on Challenges to the Financial System Ageing and Low Growth, (LG' 06), Frankfurt BIS, pp: 1-8.
- Pesaran, M.H. and Y. Shin, (1998). *An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis*. In: *Econometrics and Economic Theory in the 20th Century*, Strom, S. (Ed.), Cambridge University Press, ISBN-10: 0521633656, pp: 134-150.
- Pesaran, M.H., Y. Shin and R.J. Smith, (2001). *Bounds testing approaches to the analysis of level relationships*. *J. Applied Econ.*, 16: 289-326. DOI: 10.1002/jae.616
- Rousseau, P.L. and P. Wachtel, (2002). *Inflation thresholds and the finance-growth nexus*. *J. Int. Money Finance*, 21: 777-793.
- Shaw, E., (1973). *Financial deepening in economic development*. New York, U.S.A; Oxford university press.
- Stiglitz, J.E. and A. Weiss, (1981). *Credit rationing in markets with imperfect information*. *Am. Econ. Rev.*, 53: 393-410.
- Toda, H.R. and T. Yamamoto, (1995). *Statistical inference in vector autoregressions with possibly integrated processes*. *J. Econ.*, 66: 225-250. DOI: 10.1016/0304-4076(94)01616-8.
- Volcker, P.A., (1983). *We can survive prosperity*. Joint San Francisco, California.

## APPENDICES

### APPENDIX A DIAGNOSTIC TEST RESULTS

#### DIAGNOSTIC TEST

##### NORMALITY TEST



#### AUTOCORRELATION

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.9990056	Prob. F(2,22)	0.384345
Obs*R-squared	2.6642357	Prob. Chi-Square(2)	0.263917

#### HETEROSKEDASTICITY

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.571287	Prob. F(7,24)	0.008979
Obs*R-squared	16.32621	Prob. Chi-Square(7)	0.022297
Scaled explained SS	9.807677	Prob. Chi-Square(7)	0.19973

## MULTICOLLINEARITY TEST

Variance Inflation Factors

Date: 10/04/18 Time: 14:06

Sample: 1980 2015

Included observations: 32

Variable	Coefficient Uncentered		Centered
	Variance	VIF	VIF
			1.3089562134061
EXRATE	0.453540	1.30895	6
			1.0790512956005
GDPPC	0.00000412	1.33035	81
			1.3658513450193
GOV	0.0129136	1.3668	02
			1.0823025893660
INFL	0.00004506	1.08267	3
			1.2893194383400
INT	0.0031875	1.289929	34
			1.2437940548980
TRGDP	0.000483	1.312670	2
			1.6607405413145
COMPUTER	0.002233	1.694034	03
C	0.05854	1.2883	

## STABILITY TEST

