UNIVERSITY OF CAPE COAST

EFFECT OF MONETARY POLICY RATE ON PROFITABILITY OF UNIVERSAL BANKS IN GHANA

TIMOTHY AYIMBIRE ATUBIGA

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BY

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Dissertation submitted to the Department of Finance of the School of Business, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfillment of the requirements for award of Master of Business Administration degree in Finance

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis 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..... Date.....

Name: Timothy Ayimbire Atubiga

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 University of Cape Coast.

Supervisor's Signature..... Date….....

Name: Dr. Siaw Frimpong

ABSTRACT

The contribution of financial institutions towards the allocation of resources and growth a country cannot be overemphasized. The maintenance of asset quality, efficiency and profitability is a vital requirement for the survival and development of universal banks. One factor that has been identified as affecting universal banks' profitability is the monetary policy rate. The study therefore sought to determine the effect of monetary policy rate on universal banks profitability. Using annual data spanning 1984 to 2017, the study provided evidence from an autoregressive distributed lag estimation technique to show that the monetary policy rate is significant driver of universal banks' profitability in Ghana. The study recommends that universal banks revise their lending policy depending on the situation and economic condition of the country as well as minimising their periodic loans targets by not engaging in risky loaning practices.

KEY WORDS

Autoregressive Distributed Lag Monetary Policy Rate

Non-performing Loans Profitability

Universal Banks

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DEDICATION

To my lovely wife, Benedicta Nyuor and my children, Felix Atubiga, Festus Atubiga, and Fredrick Atubiga.

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LIST OF ACCRONYMS

ADF Augmented Dickey-Fuller ARDL Autoregressive Distributed Lag ATM Automated Teller machine

BoG Bank of Ghana

CAR Capital Adequacy Ratio

CEMAC Central African Economic and Monetary Community

CIT Corporate Income Tax

CPI Consumer Price Index

CUSUM Cumulative Sum of Recursive Residuals CUSUMSQ Cumulative Sum of Square Recursive Residuals ECM Error Correction Model

ECT Error Correction Term

ETR Effective Tax Rate

EXH Real Effective Exchange Rate

DW Durbin-Watson

GDP Gross Domestic Product

GDPG Gross Domestic Product Growth GCB Ghana Commercial Bank

GMM Generalized Methods of Moments GPC Gross Domestic Product Per Capita IMF International Monetary Fund

INF Inflation Rate

LNPL Log of Non-Performing Loan LRATE Lending Rate

LROA	Log of Return on Assets
LTD	Loan to deposit
LUNP	Log of Unemployment Rate
NPL	Non-Performing Loan
OLS	Ordinary Least square
PP	Phillips-Perron
ROA	Returns on Asset
ROE	Return on Equity
S.E	Standard Error
UNP	Unemployment Rate
USA	United States of America
VAR	Vector Auto Regression
VECM	Vector Error Correction Model

CHAPTER ONE

INTRODUCTION

Background of the study

A sound budgetary framework is crucial for a solid and developing economy. The banking segment constitutes a transcendent component of the financial framework of any economy (Singh, 2010). The banking division plays an imperative part in channeling funds from savers to borrowers. The development and improvement of an economy to a great extent depends on the victory and proficient working of the banking division (McKinnon & Shaw, 1973). Banks are the foremost noteworthy players within the Ghanaian monetary advertise (Established of Measurable, Social and Financial Investigate, 2013). As at 2008, the Managing an account framework in Ghana accounted for 70 percent of the money related segment (Bawumia, Owusu & McIntyre, 2008). This makes the commercial managing an account division basic to the advancement of the economy as disappointment of this sector might have antagonistic systemic impact on the whole economy.

The Ghana banking sector has witnessed many reforms and restructuring over the years as a result of internal and external economic developments and shocks. Recent developments in the banking sector are the adoption of International Financial Reporting Standards (IFRS) in line with international standards by Bank of Ghana as a way of reducing systemic risk (Ackah & Asiamah, 2014). Other developments include the establishment of Collateral Registry and Credit Reference Bureaus that seeks to promote transparency and ease credit accessibility, the setting up of the Financial Intelligence Centre (FIC) to address money laundering and counter financing for terrorism. Also worthy of mention is the recapitalization of the banks required by Bank of Ghana to ensure financial stability. All these measures by Bank of Ghana are believed to have been fashioned to mitigate risk and stabilize the

banking system. These reforms are backed by tighter and effective supervisory oversight to ensure financial stability and soundness of the financial system (Ackah & Asiamah, 2014)

Managing an account division changes have changed the Ghana keeping money industry viewpoint. These well sequenced budgetary division changes have been driven by managing an account division liberalization, improved competition, and slow capital account liberalization. It is hence sensible to expect that these changes have changed the way commercial banks in Ghana work and hence, their execution (Bawumia, Owusu & McIntyre, 2008).

Due to the changing banking environment, profitability which is one of the foremost important criteria to degree performance of banks has come beneath intense pressure. Profitability is basic to the survival of commercial banks. Firstly, profits are paid from benefits (cash benefits) and furthermore, benefit is an imperative source of held profit. Held profit are remaining benefits after profits are paid. These profits are imperative components of bank capital (Bawumia, Owusu & McIntyre, 2008).

Banks are the largest sector in the financial industry. Thus, failure in the banking system may have deep economic repercussion for the economy at large. Secondly, banking sector reforms are likely to affect the way banks operate and thus their performance. Finally, bank profitability is an important source of retained earnings; a very important component of bank capitalization, providing a margin of protection during recessionary periods, and enabling the banks to be more resilient against external shocks (Ackah & Asiamah, 2014)

In a recent study that focuses on effectiveness of monetary policy, Kandil (2014) and Jain-Chandra and Unsal (2014) highlighted the importance of monetary policy to stabilize the economy of developing countries. However, how fast economic

stability is achieved depends on the pass-through to bank lending rate and financial market development among others. According to the Ghana Banking Survey (2010), the banking industry profits showed a declining trend in recent years despite increase in deposits and branch networks (see Figure1). The gradual reduction in the monetary policy rate by the Bank of Ghana is expected to give commercial banks much room to lend, create more monies and enjoy higher returns. However, asset quality has been on the decline increasing industry impairment charge for loan.

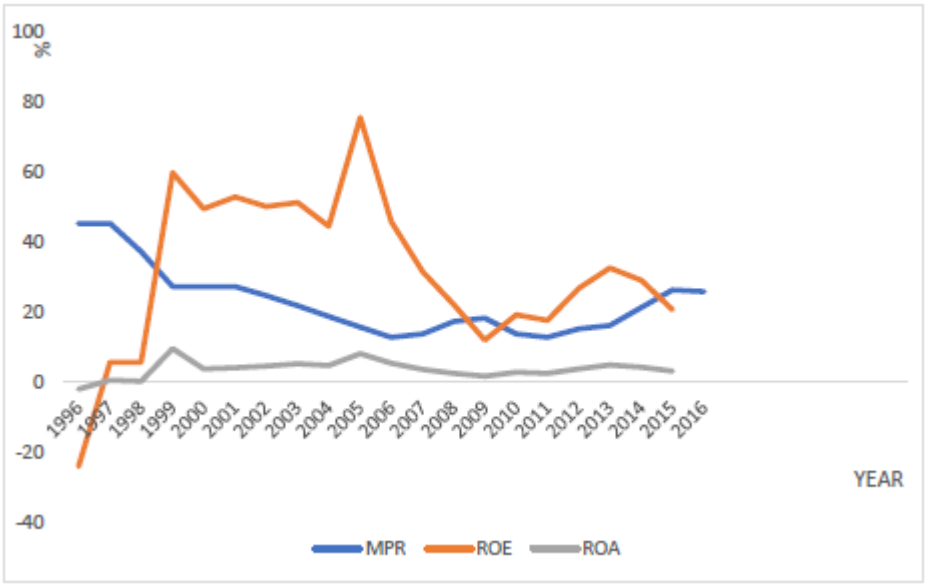

Figure 1: Trend of Monetary Policy Rate, Return on Asset and Return on Equity
Source: By Author with Data from WDI, 2019

The Figure 1 juxtaposes the trend of Monetary Policy Rate (MPR) to that of commercial banks' profitability measured by Return on Asset (ROA) and Return on Equity (ROE). The link between MPR and ROE appears to be significant since global financial meltdown in 2007 suggesting a significant plausible impact of monetary policy rate on commercial banks' profitability.

Problem Statement

Financial arrangement rate and commercial banks productivity are

complicatedly connected together. In reality, the appraisal of the Managing an account Framework (especially within the region of credits and progresses) can be assessed through the execution of financial arrangement devices, which can be broadly classified into two categories- the portfolio control approach and showcase mediation. Olokoyo (2011) communicated that, commercial banks choices to loan out credits are affected by a part of components such as the winning intrigued rate, the volume of stores, the level of their household and remote speculations, banks liquidity proportion, distinction and open recognition to specify but some. Monetary arrangement rate, as a money related approach apparatus is basic within the request for and supply of saves held by vault educate and subsequently, on accessibility of credit.

The recent review in monetary policy rate is believed to have significant impact on the economy through improved profitability of universal banks. From 2010, interest rate charged by banks for credit has continued to rise, thereby causing much distortion in the financial intermediation process leaving the increase in interest rate unchecked and performance of credit extended by banks to the general public unstable, even in the light of slight inflationary pressures (Bawumia, Owusu & McIntyre, 2008).

Monetary policy rate for the period under study averages over 20%, which is very high when compared to the government desire for a single interest rate regime for loans and advances. In just over six months the monetary policy rate which stood at 25% has been reviewed to 22.5%. This new development by

the Bank of Ghana is expected to lubricate the economy through access to loans and investments. Thus, monetary policy rates affect inflation which has consequence on savings which affect loanable funds and interest rates of banks and finally their profitability. In view of this, the study seeks to determine the effect of monetary policy rate on the profitability of universalbanks.

Purpose of the Study

The purpose of the study is to assess the effect of Monetary policy rate on Universal Banks profitability. Specifically, the study aims at establishing:

1. The short-term impact of monetary policy rate on Universal banks profitability (Returns on Assets).
2. The long-term impact of monetary policy rate on Universal banks profitability (Returns on Assets).

Research Hypotheses

In this study, the researcher aims to find tests the following hypotheses:

1. H_0: There is no long-run impact of monetary policy rate on universal banks profitability

H_1: There is a long-run impact of monetary policy rate on universal banks profitability (Return on Assets).

2. H_0: There is no short-run impact of monetary policy rate on universal banks profitability.

H_1: There is a short-run impact of monetary policy rate on universal banks profitability.

Significance of the Study

The study will help Commercial banks and other businesses that perform auxiliary banking to know the extent to which monetary policy rate affects their

profitability and hence take the necessary steps to improve upon their loan portfolios and credit management.

Scope of the Study

The scope of this study will cover the period 1984-2014 (30years). This dissertation is segmented into five chapters. The first chapter is the introduction. Chapter two contains literature review, chapter three contains the methodology used in the study, chapter four contains data presentation and analysis, finally, chapter five contained findings made and policy recommendations.

Delimitation of the Study

The problem of monetary policy rate is not limited to one bank. But for simplifying the study the researcher selects Universal Banks which is the biggest umbrella of commercial banks in Ghana. The study covers the period from 2000 to 2014. Also, even though nonperforming loans can affect various components in the financial sector, its effect on the profitability of the commercial bank will only be looked at.

Organization of the Study

The study has five chapters. The first chapter includes background of the study, background of the organization, statement of problems, objective of thestudy, basic research questions, significance of the study, delimitation of the study, and organization of the study. The second chapter deals with the review of literature and empirical studies of monetary policy rate and performance of commercial banks in general. Chapter three includes research design and methodology of the study. Chapter four contains analysis, discussion and results and the last chapter deals with the conclusions drown and recommendations that originates from the analysis.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter provides a review of the existing literature on effects of monetary policies on performance of commercial banks. The main sections included therein were: theoretical review, conceptual framework, and empirical review, critique of existing literature relevant to the study, summary and research gaps.

Theoretical review

Overview of the Banking System in Ghana

Banking Sector has gone through a arrangement of changes after the liberalization of the economy and the presentation of money related segment changes. Indeed in spite of the fact that keeping money is as primitive as human society, it has gone through changes in numerous ways world-wide all through the a long time. Most banks nowadays offer a wide extend of items and administrations than ever some time recently, and their central capacities of putting the community‘s overflow reserves (stores and venture) to work by loaning to individuals stay unaltered because it has continuously been. These changes came as a result of government arrangements, globalization, financial deregulation and data, communication innovation (Hinson, Mohammed & Mensah, 2006). In reality, banks are imperative to the wellbeing of a nation’s economy; monies collected by the bank from the community are given back to the community within the shape of advances to purchase houses and cars, to begin and extend businesses, to pay children’s school expenses and for other various purposes.

In Ghana, the banking industry has not only increased in products and services, but also increased in terms of numbers. The first bank, the Bank of British West Africa (now StandChart Bank) was established in 1896. Owusu-Antwi (2011)

testified that within a short time the bank was able to acquire the business of maintaining the Government accounts and introduced the use of cheques in settlement of Government accounts which helped to educate the public on the usefulness of banking.

George and Prabhu (2000) assist affirmed that, due to fruitful operation of the afore-mentioned bank, another bank, the Colonial Bank presently Barclays Bank Ghana was too set up in 1918. The biggest inborn money related institution within the nation, famously known Ghana Commercial Bank was set up in 1953. The Bank of Ghana which is the central Bank of the Republic of Ghana was shaped in 1957. The Agrarian Advancement Bank (ADB) was set up by an Act of Parliament (Act, 286) in 1965 to advance and modernize the rural division through suitable but productive monetary intermediation. Its unique title at that point was the Rural Credit and Co-agent Bank and the setting up Act gave its main objective as "to supply credit offices to agriculturists and people for associated purpose". Agyapong (2015) expressed that the ADB which was made to benefit the rustic segment started to concentrate on conventional urban-based managing an account exercises.

Types of Banks

A bank acknowledges stores from the open and makes credit. Banks are presently moving towards the worldwide guidelines and standards. The framework of keeping money has ended up more clients arranged presently. A have of modern money related items have been presented and the generally monetary environment within the nation is getting a parcel more develop with people taking intrigued within the modern items.

The following are some of the types of banks we have (Owusu-Antwi, 2011). Central banks are the banks for every government. They are also responsible for the regulation of other banks and the financial regulations within that country. Universal

banks are more or less a combination of both commercial and investment attributes of a bank in addition to other complex banking activities which might include even two or more international transactions. Commercial banking involves complex banking activities for business and individuals. Apart from the savings and loans they engage in, they are equally there to provide more dynamic services such as management of cash flows, letters of credit and underwriting debt for individuals, industry and sometimes government (Owusu-Antwi, 2011). Investment banks largely enable business in the financial market. They organise IPOs of companies and offer advice and risk analysis on existing stocks both listed and non-listed.

Keynesian Theory

The Keynesian hypothesis expressed that a few microeconomic-level activities on the off chance that taken collectively by a huge extent of people and firms can lead to wasteful total macroeconomic results, where the economy works underneath its potential yield and development rate. Most Keynesians advocate an dissident stabilization arrangement to decrease the plentifulness of the trade cycle, which they rank among the foremost genuine of financial issues. Keynes contended that the arrangement to the Extraordinary Discouragement was to fortify the economy ("affectation to contribute") through a few combination of two approaches: a lessening in intrigued rates and government speculation in framework. Investment by government injects income, which results in more spending in the general economy, which in turn stimulates more production and investment involving still more income and spending.

The initial stimulation starts a cascade of events, whose total increase in economic activity is a multiple of the original investment. A central conclusion of Keynesian economics is that, in some situations, no strong automatic mechanism moves output and employment towards full employment levels. This conclusion

conflicts with economic approaches that assume a strong general tendency towards equilibrium. In the 'neoclassical synthesis', which combines Keynesian macro concepts with a micro foundation, the conditions of general equilibrium allow for price adjustment to eventually achieve this goal.

Irving Fisher's Version of Quantity Theory of Money Demand

Present day speculations of cash created had their establishment on fisher's personality. In creating early speculations on cash request, sees on cash were constrained to it work as it were as a medium of trade. The hypothesis proposed that the as it were reason families and businesses (financial operators) request cash is for value-based exercises. This hypothesis too expect that cash have no natural utility which makes it alluring for its claim purpose, and no one wants to hold cash but operators are obliged to do so due to need of synchronization between cash receipts and installments. The existence of a time lag between receiving payments from the sale of goods and services purchased necessitates the holding of cash balances and velocity of circulation of money fix in the short run and changes only slowly in the long run.

Irving Fisher's version of amount hypothesis of cash request examination begun with a basically character. Thus, to every transaction there is a buyer and a seller, hence for the entire economy's sales value must be equal to the value of receipts. Fisher explained his theory in terms of his equation of exchange, which is given as: $M_sV = PT$.

That is, value of sales must be equal to number of transactions conducted over a given time period multiplied by average price of the various transactions. The value of purchases must equal to the amount of money in circulation in the economy times the average number of times it changes hands over the same time period. From the

identity, M_s is the quantity of money supply which is determined independently of T, P and V and is given at any given time. T, the volume of transactions, is also determined independently of M_s, P and Vin the identity. P is price level and V is velocity at which money circulates.

If the velocity and transaction remain unchanged or held constant, $\Delta V = \Delta T = 0$ then $\Delta Ms = \Delta P$. The implication of quantity theory of money is that quantity of money is the main determinant of price levels or value of money. Any change in the quantity of money produces an exact proportionate change in the price level. In the words of Irving Fisher, other things remaining unchanged, as the quantity of money in circulation increases, price level increases in direct proportion while value of money decreases and vice versa (Acheampong, 2008)

The Fisherian quantity theory has been subjected to several criticisms by economists. According to Keynes, "The quantity theory of money is a truism." Fisher's equation of exchange is a simple truism because it states that the total quantity of money paid for goods and services must equal their value. But it cannot be accepted today that a certain percentage change in the quantity of money leads to the same percentage change in the price level.

Moreover, the direct and proportionate relation between quantity of money and price level in Fisher's equation is based on the assumption that "other things remain unchanged". In real life, velocity of circulation and volume of transaction are not constant. Moreover, they are not independent of M_s and P. Rather, all elements in Fisher's equation are interrelated and interdependent. For instance, a change in M_s may cause a change in V. Consequently, the price (P) level may change more in proportion to a change in the quantity of money (Chand, 2013).

Thirdly, Fisher's model failed to measure value of money. Hisequation does not measure the purchasing power of money but only cash transactions, that is, the

volume of business transactions of all kinds or what Fisher calls the volume of trade in the community during a year. But the purchasing power of money (or value of money) relates to transactions for the purchase of goods and services for consumption. The quantity theory fails to measure the value of money.

Keynes severely criticised the Fisherian quantity theory of money for its unrealistic assumptions. First, quantity theory of money is unrealistic because it analyses the relation between money supply and price level in the long run. Thus it neglects the short run factors which influence this relationship. Second, Fisher's equation holds well under the assumption of full employment. But Keynes regards full employment as a special situation. The general situation is one of the under-employment equilibriums.

Third, Keynes does not believe that the relationship between the quantity of money and the price level is direct and proportional, rather an indirect one via the rate of interest and the level of output. According to Keynes, "So long as there is unemployment, output and employment will change in the same proportion as the quantity of money, and when there is full employment, prices will change in the same proportion as the quantity of money." Lastly, he pointed out that when there is underemployment equilibrium, the velocity of circulation of money is highly unstable and would change with changes in the stock of money or money income. This was unrealistic for Fisher to assume velocity to be constant and independent of money (Mishra and Montiel, 2013).

Shopping Time Model of Money Demand

Shopping time model of money assumes an individual agent lives for two periods, now (period 1) and in the future (period 2), and possesses stocks of bonds (B_0) and money (M_0) that were accumulated in the past. If the economic agent has real endowment income which is fixed in the period 1 and period 2 (Y_1 and Y_2

respectively), and he consumes in the two periods which is denoted as C_1 and C_2, respectively. If P_1 and P_2 are prices of the goods in the two periods, respectively, then the periodic budget identity for the two period will be given as:

$P_1Y_1 + M_0 + (1 + i_0)B_0 = P_1C_1 + M_1 + B_1$, equation 1.0

$P_2Y_2 + M_1 + (1 + i_1)B_1 = P_2C_2 + B_2$

Where i_t is nominal interest rate on bonds and M_t is the nominal money balance in period t. The left-hand side of the above expressions represents the total resources available to the household whilst the right-hand side represents what the resources can be spent on. Since the model assumes two time periods, in period 3 the agent will not be around and there is no bequest motive in addition, he will not wish to die with positive stocks of money and/or bonds (i.e. $M_2 \leq 0$ and $B_2 \leq 0$). The financial sector will not also allow him die indebted ($B_2 \geq 0$) and the agent cannot create money ($M_2 \geq 0$).

This means $M_2 = B_2 = 0$, so that the equations can be combined into the following consolidated budget constraint:

Assuming households or economic agents value leisure time and that part of their time endowment is spent on shopping around for goods. Money is useful in the sense that it makes shopping easier, by using money the agent can save leisure time which otherwise could be spent on shopping. Suppose the household has a time endowment of unity (1), works a fixed amount of time units N and spends S_t units of time on shopping. The agent leisure in period t is

$(1 - N - S_t)$ units of t and his utility function becomes:

$$V = U(C_1, 1 - N - S_1) + \left(\frac{1}{1+p}\right)U(C_2, 1 - N - S_2) \qquad \text{Equation 2.2}$$

Where $\rho > 0$. Equation 2.1 is the inter-temporal budget constraint, with

endowment income representing real labour income, $Y_t \equiv (W_t / P_t) N$, where $\bar{W}_t$ is the nominal wage rate in period t. The shopping technology is assumed to take the following form;

1- $N - S_t = \Psi(m_{t-1}, C_t)$ Equation 2.3

The household chooses C_t, S_t (for t=1,2), and m_1 (m_0 being predetermined) in order to maximize equation (2.2) subject to equation (2.1) and (2.3), and the non-negativity constraint on money balances ($m1 \geq 0$).The Lagrangean expression is:

$$L = U(C_1, 1 - N - S_1) + \left(\frac{1}{1+P}\right)U(C_2, 1 - N - S_2) + \lambda[W - C_1 - \frac{C_2}{1+r_1} - \frac{i_1 m_1}{1+i_1}] - \sum_{t=1}^{2} \lambda_t[1 - N - S_t - \Psi(m_t - 1, C_t)]$$

Where λ_t are the Lagrangean multipliers associated with the shopping technology in the two periods. The first-order conditions (FOCs) are:

— $\frac{\partial L}{\partial C_1} = U_{c1}(.) - \lambda + \lambda_1 \psi(m_0, C_1) = 0$ equation 2.4

— $\frac{\partial L}{\partial C_2} = (1+P)^{-1} U_{c2}(.)(1+r_1)^{-1}\lambda + \lambda_2 \psi_{c2}(m_1, C_2)$ Equation 2.5

— $\frac{\partial L}{\partial S_1} = -U_{S1}(.) + \lambda_1 = 0$ Equation 2.6

— $\frac{\partial L}{\partial S_2} = -(1+\rho)^{-1} U_{S2}(.) + \lambda_2 = 0$ Equation 2.7

$\frac{\partial L}{\partial m_1} = \lambda\left(\frac{-i_1}{1+i_1}\right) + \lambda\psi_{m_1}(m_2, C_2) \leq 0, m \geq 0, m_1 \frac{\partial L}{\partial m_1} = 0$ Equation 2.8

Where $U_c(\cdot)$ and $U_s(\cdot)$ denote the marginal utility of consumption and leisure, respectively. From the first order conditions, the household will hold money provided that marginal utility of leisure and /or money are high enough. (Laidler, 1993; Barro and Martin, 2004).

Overlapping Generations Model (OLG) Of Money Demand

Overlapping Generation model is based on inter-generation friction, of the type first emphasized by Samuelson in order to motivate a meaningful role of money. The model assumes that at time t, half (N/2) of the population consists of young agents and half (N/2) old agents and normalising N to unity to simplify the notation. It also assumes that all agents live for two periods, the young have two periods to live but the old only

one. Y is the endowment young agents receive, but do not have any endowment income when they are old. It means the old aged agent will depend on his endowment accrued during his young age. The output or endowment Y is potentially storable, which is stored in goods and

for each unit stored in period t, $\frac{1}{(1+\delta)}$ (Storage technology) units of output will be left over in period t+1 (period two), where δ is depreciation rate.

If δ approaches infinity, then the goods in question is perishable (spoil immediately and are thus non-storable), on the other hand if δ is zero then goods keep indefinitely. If δ ranges between negative one and zero ($-1 < \delta < 0$), goods multiply (thus goods reproduce without supervision by the storage process). The young agent can either consume output when young (C_y^t), store it (K_t) of which $\frac{K_t}{(1+\delta)}$ (thus K_t multiply by storage technology) will be available in period t+1, or trade it for fiat money. Since the money price of output is P_t, the last option yields the young agent real money balances at the end of period t ($m = \frac{M_t}{P_t}$). The budget identity facing a young agent in his youth is: $Y = C_t^y + K_t + \frac{M_t}{P_t}$. And the budget identity of an old agent in period t is: $C^o = \frac{K_{t-1}}{1+\delta_t} + T_t + \frac{P_{t-1}}{P_t} m_{t-1}$,

where K_{t-1} is output stored by agent in his youth, m_{t-1} is real money balances from previous period and T_t is transfer earnings from the government. The young agent in period t will be old in period (t+1) and will face a similar constraint of the old agent in period t but dated one period later in the last period of his life. His budget constraint then becomes:

$$C^o_{t+1} = \frac{K_t}{1+\delta} + T_{t+1} + \frac{P_t}{P_{t+1}} m_t$$

Given lifetime utility function of the young agent in period t as: $V = U(C_t^y) + (\frac{1}{1+\rho}) U(C_{t+1}^o)$, the agent chooses C^y_t, C^o_{t+1}, K_t, and m_t to maximize lifetime utility subject to budget constraint. The lagrangean function will be

$$L = U(C^y) + \left(\frac{1}{1+\rho}\right)^t U(C^o) + \lambda_1 [Y - C^y - K_t - m_t] + \lambda_2 \left[\frac{K_t}{1+\delta} + T_t \pm \frac{P_t}{P_{t+1}} m_t + C^o_{t+1}\right]$$

Where λ_1 and λ_2 are the Lagragean multipliers of the budget identifies in youth and old age respectively, the first order conditions are as follows:

$$\frac{\partial L}{\partial C^y_t} = U'(C^y_t) - \lambda_1 = 0$$

$$\frac{\partial L}{\partial C^o_{t+1}} = (1+\rho)^{-1} U'(C^o_{t+1}) - \lambda_2 = 0$$

$$\frac{\partial L}{\partial m_t} = -\lambda_1 + \lambda_2 \left(\frac{P_t}{P_{t+1}}\right) \leq 0, \; m_t \geq 0, \; m_t \frac{\partial L}{\partial m_t} = 0$$

$$\frac{\partial L}{\partial K_t} = \lambda_1 + \lambda_2 (1+\delta)^{-1} \leq 0, \; K_t \geq 0, \; K \frac{\partial L}{\partial K_t} = 0$$

Inflation rate is defined $(\pi_t) = \frac{P_t}{P_{t+1}} = \frac{1}{1+\pi_t}$, by simplifying the equation $\pi = \frac{P_{t+1}}{P_t} - 1$.

According to this model, if inflation rate is different from the level of depreciation ($\pi_t \neq \delta$), the young agent will choose a single type of asset with the highest yield to serve as a store of value. Thus if inflation is relatively low ($\pi_t < \delta$), only money will be held by the young agent (hence $K_t = 0$, and $m_t >$

0) on the other hand, if inflation rate relatively high in relation to depreciation rate ($\pi_t >$ δ) then only goods will be stored or agent will prefer holding his wealth in the form of goods than holding cash balance ($K_t > 0 \; and \; m_t = 0$).

Government is assumed to pursue a simple money supply rule given as: $M_t = (1 + \mu)M_{t-1}$, where μ is defined as money growth rate. The additional money is used to finance the transfer to the old, i.e. the government budget restriction is $\Delta M_t = P_t T_t$. This implies the transfer in period t+1 is: $T_{t+1} =$

$\Delta M_{t+1} / \quad = \frac{\mu M_t}{P_{t+1}} \cdot \frac{P_t}{P_t} = \frac{\mu m_t}{P_{t+1}} \; \frac{}{1+\pi_t}$, by simplification. The model also describes the

reaction of the agent by varying money growth rate (μ) and the depreciation rate (δ). If the growth rate is less than the depreciation rate, agent holds money because is the best available financial instrument to store serve as a store of value (money growth rate outperforms the storage technology). Where the reverse holds, ($\mu > \delta$) the storage of technology outperforms money as a store of value and consequently the demand for real money balances will be zero. (See Handa, 2009; Romer, 1996; and Blanchard and Fischer, 1989).

Clower Constraint: Cash-In-Advance Constraint

Building a model that formally explains why money is used in transactions when it is dominated as a store of value has proved to be a difficult task. Clower argued that money is not allowed to play a distinctive role in the economy in models such as OLG and shopping time model. Looking at the budget identities of the shopping time model in equation 1.0, clearly shows that money enters the expressions exactly the same way that goods and bonds do. This suggests that any item (goods, money, or bonds) can be directly exchanged for any other item, i.e. goods for bonds, bonds for money, and goods for money, etcetera.

His argument was that an economy that admits of this possibility clearly constitutes what any Classical economists would regard as barter rather than a money economy. In a pure monetary economy, Clower argues, there is a single good, money, which is used in all transactions, and money buys goods and goods buy money: but goods do not buy goods. Clower's idea can be formalized by requiring that spending on consumption goods cannot exceed cash balances carried over from the previous period. The Clower or cash-in-advance constraint amounts to:

$P_t C_t \leq M_t$, by simplifying, this implies $C_t \leq (\frac{P_{t-1}}{P_t})m_t$ (where $m_t \equiv M_t/P_t$).

According to the model, household or agent chooses C_2 (period 2 consumption)

and m_1(real money balance) in order to maximize his utility which is:

$$V = U(C_1 \quad \text{—}) + \frac{1}{1+\rho} U(C_2).$$

Maximise consumption function subject to his consolidated budget constraint (see shopping time equation 2)

$$W \equiv Y \quad + \frac{Y_2}{1+r_1} + \left(\frac{P_0}{P_1}\right) m \quad + (1+r)b \equiv C + \frac{C_2}{1+r_1} + \frac{i_1 m_1}{1+i_1}.$$

Our lagrangean function is set as:

$$L = U\left(\frac{P_0}{P}\right) m_0 + \frac{1}{1+\rho} U C_2 \quad (\quad) + \lambda_2 \left[\left(\frac{P_1}{P}\right) m_1 - C_2\right]$$

$$+ \lambda \left[C_1 - \frac{C i_1 m_1}{1+r} \quad \text{———} \quad \text{—} \quad 1+i\right]$$

Where λ_2 Lagrangean multiplier associated with the Clower constraint.

According to this model, money is demanded not because it is valued intrinsically but because households wish to consume in the second period. The rationale is that money buys goods and goods buy money: but goods do not buy goods (see Wickens, 2008).

Determinants of Money Supply

The Monetary Base Model of Money Supply has become the standard textbook model of money supply determination and can be seen as an extension of the traditional bank deposit multiplier approach to deposit creation. According to literature the total volume of deposits (D) is equal to the multiplier $1/r$ of the system's cash reserves (R), where r is the cash reserve ratio impose on banks by authorities.

Thus $D = (\frac{1}{r})\, R$, alternatively $rD = R$ Equation 2.9

The cash reserve constitutes only part of the total amount of cash potentially available to the banks. The total quantity available is the monetary base or high- powered money (H) which consists of the cash reserves held by banks and currency in circulation outside the banks (CU), thus:

$H = CU + R$ Equation 2.10

Assuming that the public's holding of cash remains constant and that demand for cash rise with an expansion of deposits, i.e. the non-bank private sector maintains a fixed ratio c of cash to deposits,

i.e, $\frac{CU}{D} = c$ or $cD = CU$ Equation 2.11

$M^s = CU + D$ Equation 2.12

By dividing equation 2.12 by equation 2.10, and substituting equation 2.9 and equation 2.11 into the result, I obtained:

$$H = \frac{M}{CU + R} = \frac{cU + D}{cD + rD} = \frac{cD + D}{cD + rD} = \frac{c + 1}{c + r}$$

M^s ___ $= \frac{c+1}{c+r} H$ Equation2.13

$M^s = mH$, where M^s *and* m are money supply and money multiplier respectively. Money supply is seen as a multiple (m) of the monetary base. According to this approach, money supply determination depends on bank's cash reserve ratio (r), public's cash ratio (c) and monetary base (H). For instance, an increase in reserve ratio (r) leads to a fall in money multiplier hence falls in money supply. An increase in public's cash ratio (c) leads to a fall in

money multiplier and a fall in money supply. Lastly, increasing monetary base will lead to an increase in money supply.

Determinants of the public's cash ratio

The size of the cash ratio is determined by a number of variables. An important one is the real national income (Y). Also changes in the relative prices of goods and services normally purchased by cash and cheque ($^{Pcu}/_{Pch}$) influences the public's cash ratio. For instance, a rise in the price of food relative to the price of consumer durables (which normally is purchased with cheque),

is likely to increase the public's currency or deposit ratio. Another factor influencing the c ratio might be the extent to which bank and other credit cards are used, the incidence of wage and salary payments by cheque and uncertainties about general economic and political stability (denoting all these factors as σ). And finally, it is likely that the public's desired currency or deposits ratio will be influenced by the interest offered by the banks on deposits (r_d). The higher the interest offered by the banks on deposit accounts and the lower the level of banks charges on current accounts, the greater the incentive for the public to economize on their holdings of currency and to hold bank deposits instead. Thus the public's currency ratio may be written as: $c = f(Y,$

$^{Pcu}/_{Pch}, \sigma, r_d)$

Determinants of Banks' Reserve Ratio (r)

Banks reserve ratio may be determined by risk-adjusted rate of return on bank asset portfolio and absolute minimum ratio that banks must observe for prudence, therefore banks' reserve ratio may be written as $r = f(rr, r_L)$,where

$r_L$is the risk-adjusted rate of return on bank asset portfolio (example loans, securities) and rr is absolute minimum ratio that banks must observe for prudence. If the rate interest on loans and securities rises, the risk-adjusted marginal rate of return $\boldsymbol{r_L}$ from such assets increases and banks will be induced to make marginal movement out of cash and into loans and securities, thereby lowering their cash to deposit ratio. On the other hand, if interest to be earned on loans and securities falls, then given the risk attached to holding them, their attractiveness reduced and banks will be a marginal movement out of such assets (loans and securities), thereby raising the cash-to-deposits ratio.

According to this version of the money supply multiplier approach, the ability of the monetary authorities to control the money supply depends upon the stability and predictability of the two cash ratios – thus the public cash ratio and banks' reserve ratio. If the ratios and hence the money supplier multiplier are reasonably stable, as assumed by the supporters of this approach, then there will be a strong link between the money supply and the monetary base. Under such circumstances, monetary authorities or the central bank will be able to control the money supply by varying the monetary base.

Determinants of the Monetary Base (High Powered Money)

The monetary base is equal to the sum of net credit to government (NCG), credit to the private sector and net foreign assets (NFA).Therefore, a more comprehensive and realistic model of money supply determination should ideally incorporate the main determinants of the monetary base, which the authorities have to take into account in

order to control the money supply. From equation 2, high powered money was define H $= CU + R$, which can be expanded as

$$H = CU + R = (CG - GD) + CP + (FA - FL) \quad \text{Equation 2.14}$$

$$H = NCG + CP + NFA \quad \text{Equation 2.15}$$

Where GD is government deposits with central bank, CG is central bank's credit to government, CP is Commercial Bank credit to private sector, FL is liabilities, FA is Foreign Assets, NCG is net credit to the government and NFA is net foreign assets. The money supply empirical function now becomes:

$$M^s = f(Y, {}^{Pcu}/_{Pch}, \sigma, r_d, NFA\ CP\ NCG)$$

For simplicity, the model assumes government deficit where this deficit is financed by borrowing domestically from the central bank and the private sector. Thus: $G - T = \Delta CG + \Delta DB$

$$(G - T) - \Delta DB = \Delta CG \quad \text{Equation 2.16}$$

Where DB is Bonds to private sector. From equation 7, the government side can be expanded. Solving equation 7 and equation 8 simultaneously gives:

$$(G - T) - \Delta DB = \Delta GD = \Delta H + \Delta GD - \Delta CP - \Delta NFA$$

$$\Delta H = (G - T - \Delta GD) + \Delta CP - \Delta DB + \Delta NFA \quad \text{Equation 2.17}$$

Note:

$(G - T - \Delta GD)$ = Fiscal deficit

$(\Delta CP - \Delta DB)$ = Net credit to private sector ΔNFA = Net foreign assets

Thus, changes in the stock of monetary base are brought about by fiscal policy, monetary policy and the balance of payment. Other things remaining equal, the stock of monetary base is increased by a fiscal deficit, a balance of payment surplus, and the central bank lending to the banking system and it is reduced by open market operations.

Keynesian Framework of IS/LM Model

This is one model widely used by economic forecasters in the IS/LM model. It is valuable because it provides a deeper understanding of how government policy can affect aggregate economic activity. IS curve traces out the points at which the total quantity of goods produced equal total quantity of goods demanded. It describes points at which the goods market is in equilibrium (Mishkin, 2004). LM curve is a combination of output and the interest rate that lead to equilibrium in the money market for a given price level (Romer, 1996). The condition for the supply and demand for real money balance at a given price level is given as:

$\frac{M}{P} = L(i, Y)$, where $L_i < 0$ *and* $L_Y > 0$.

Shifts in the LM curve are caused by either an autonomous change in money demand or a change in the money supply. Figure 2 shows how either of these changes leads to a shift in the aggregate demand curve. Assume, we are initially at the AD_1 aggregate demand curve, and we look at what happens to the level of equilibrium output when the price level is held constant at P_A (the price level, P_A, is exogenous and is unchanged in the short run). Given that the Central Bank is following an expansionary monetary policy by increasing nominal money supply (M), the real money balance ($M^s = M/P$) will then increase.

This triggers the LM curve to shift to the right from LM_1P_A to LM_2P_A and raises equilibrium output to Y_2 and reduces equilibrium interest to i_B. This fall in interest rate increases investment which shift aggregate demand curve to the right (from AD_1 to AD_2). This rise in equilibrium output is shown as a movement from point A to point B.

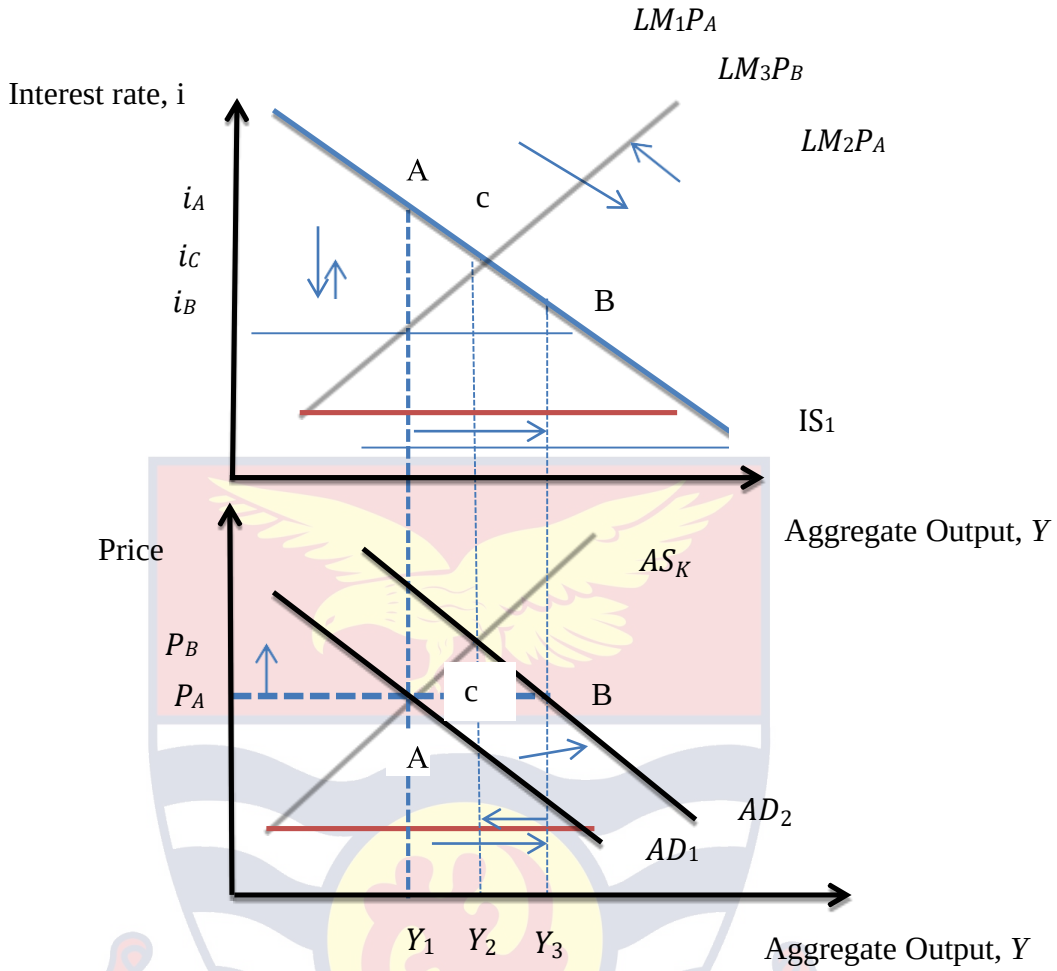

Figure 2: Illustration of Keynesian Framework of IS/LM model

Holding the price level constant, any factor that shifts the LM curve shifts the aggregate demand curve in the same direction. Therefore, a decline in money demand as well as an increase in the money supply, both of which shift the LM curve to the right, also shifts the aggregate demand curve to the right. The aggregate demand curve will shift to the left, however, if the money supply declines or money demand rises (Mankiw, 2010).

Nominal money supply $M^s \uparrow$ (holding priceP) $\rightarrow \bar{i} \downarrow \rightarrow$ Investment $\uparrow \rightarrow$ aggregate demand Y ↑.

At point B in panel B, total quantity demanded exceeds aggregate supply (excess demand), pressures price level to increase. Real money balance falls

backwards due to the rise in price level, LM falls from LM_2P_A to LM_3P_B, equilibrium output falls to Y_3. Nominal money supply M ↑ (holding priceP) → i ↓→ Investment ↑→ aggregate demand Y ↑→

price level, P ↑→ real money supply M^s ↑.

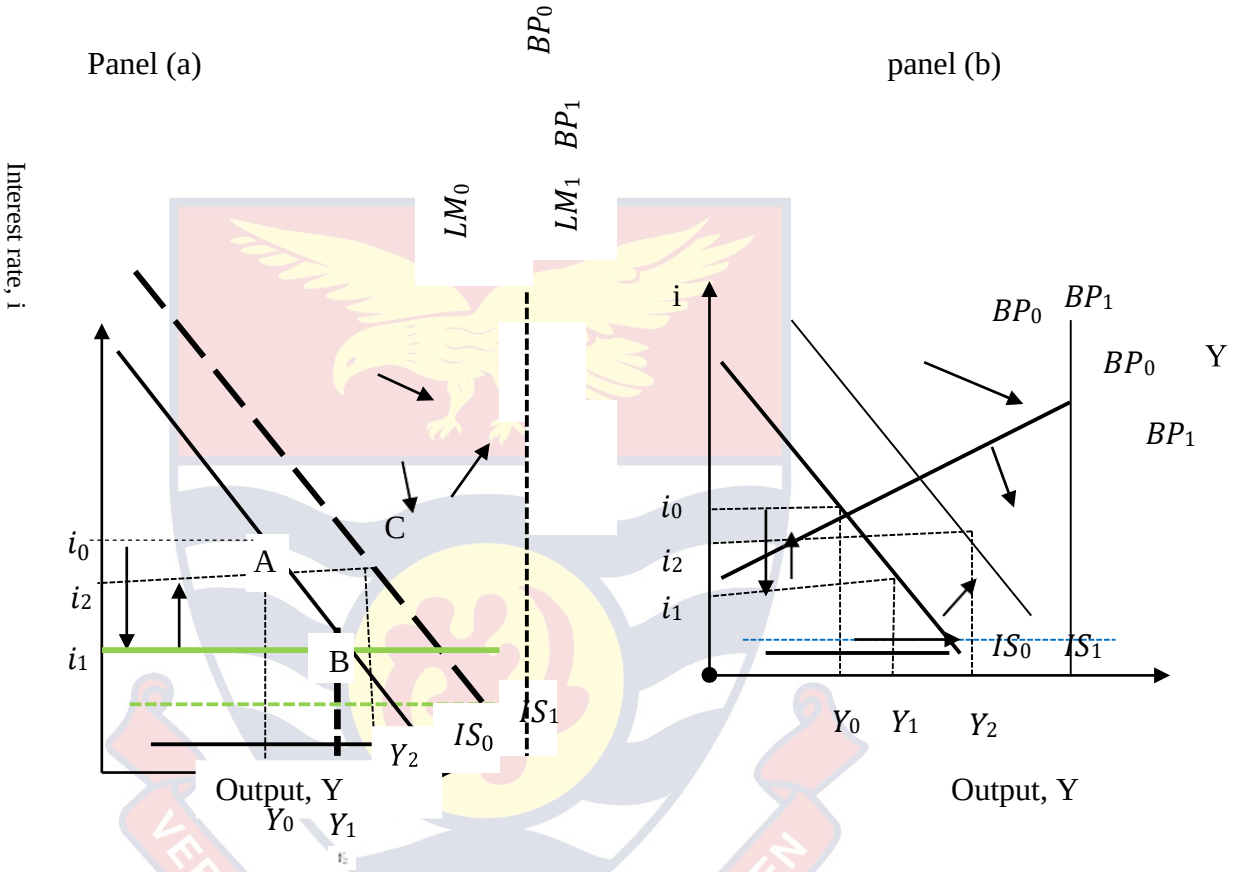

Figure 3: Impact of nominal money supply under flexible exchange rates

As depicted in Figure 3, expanding nominal money supply increases income, given initial price (P_0) the increase in aggregate income will shift aggregate demand from AD_0 to AD_1 which put upward pressure on price. The increase in domestic prices reduces the real money supply and causes the LM curve to shift to the left from LM_1 to LM_2. Increase in domestic price discourages trade balance, export falls and imports increase. The fall in the net export (NX) causes IS and the BP to shift inward and this continues until the three curves again intersect at a common point where internal equilibrium is attained at (i_2 and Y_2) (Mankiw, 2010).

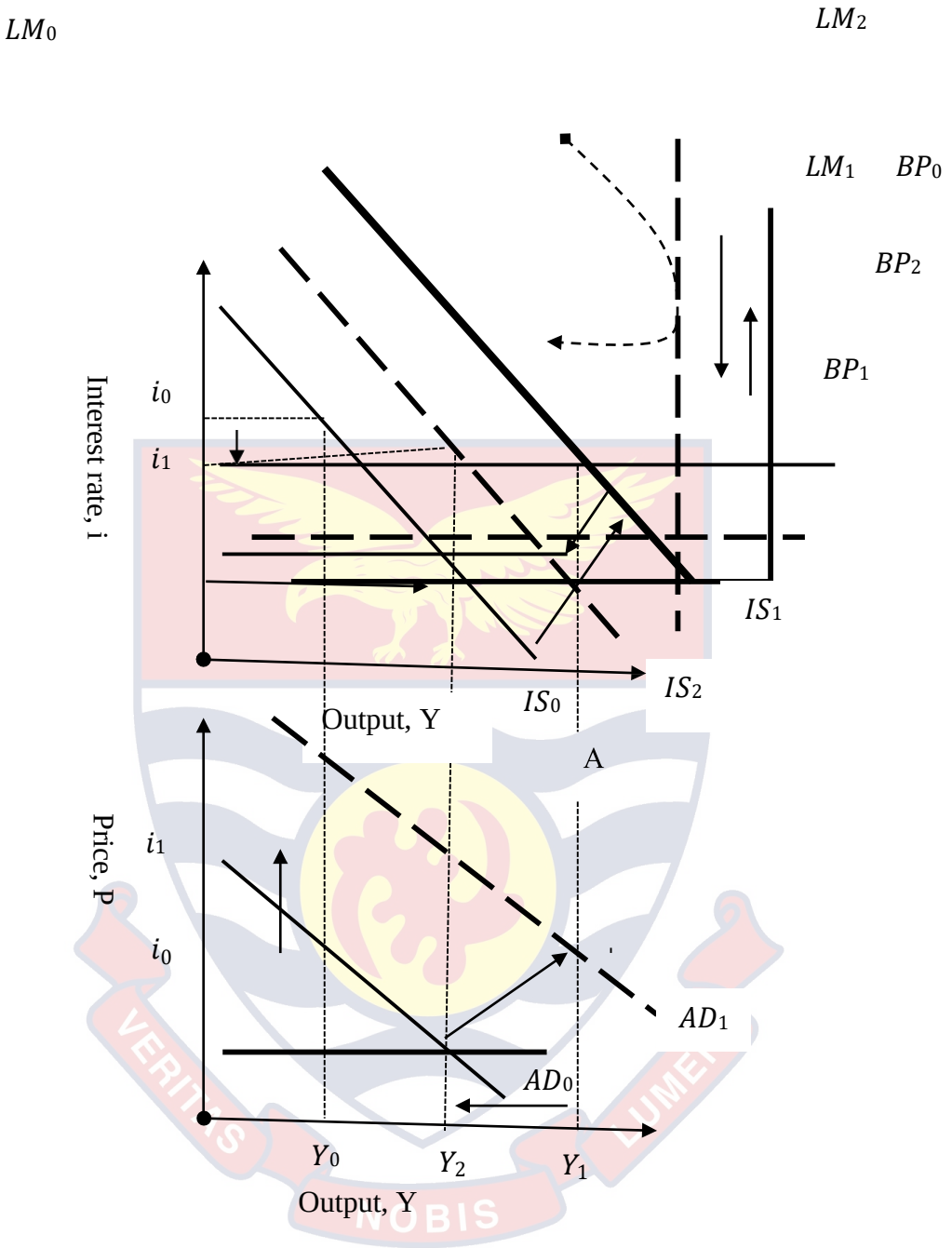

Figure 4: Impact of nominal money supply on the real economy under flexible exchange rates

Conceptual Framework

This study was guided by the following conceptual framework which indicates the relationship between the variables;

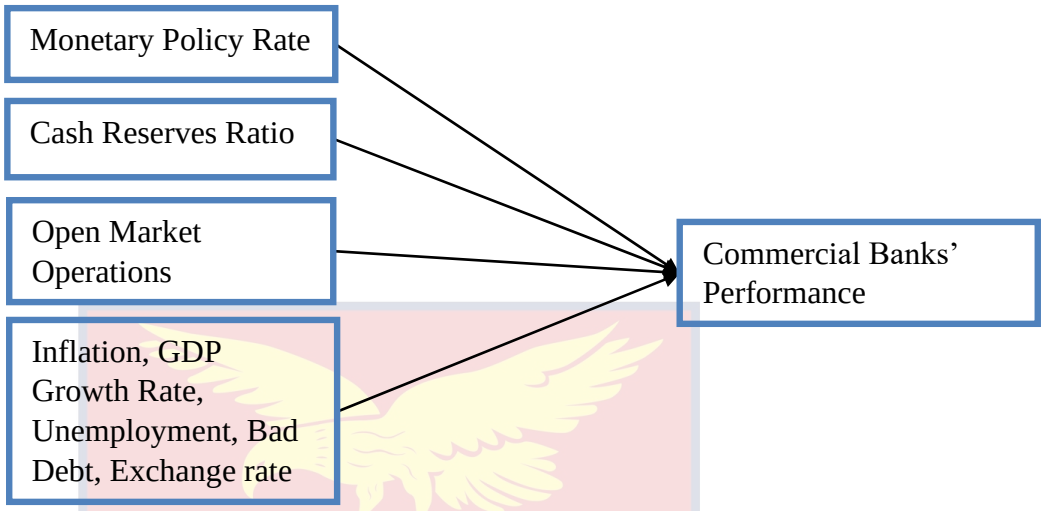

Figure 5: Conceptual Framework

Monetary Policy Rate

The conclusion is that an increase in nominal money supply reduces interest rate, causes prices to rise and finally increases output. The model is more versatile and allows us to understand economic phenomena that cannot be analyzed with the simpler Keynesian cross framework. The IS/LM model will help you understand how monetary policy affects economic activity and interacts with fiscal policy (changes in government spending and taxes) to produce a certain level of aggregate output; how the level of interest rates is affected by changes in investment spending as well as by changes in monetary and fiscal policy; how best to conduct monetary policy; and how the IS/LM model generates the aggregate demand curve. (Tobin, 1947 or Mankiw, 2010). **Monetary Transmission Mechanisms**

This describes how policy induced changes in nominal money stock or short-term nominal interest rate impact real variables such as aggregate output and employment. I review theoretical literature on specific channels that monetary policy has on aggregate output using Mundell – Fleming model.

Mundell-Fleming Model (Money Supply Channel)

This model also known as the IS-LM-BP model is an extension of IS- LM model, which was formulated by Robert Mundell and Marcus Fleming. Basically, this model is a version of the IS-LM model for an open economy. In addition to the balance in the goods and financial markets, the model incorporates an analysis of the balance of payments (BP).

Assuming imperfect capital mobility under flexible exchange rates where the central bank does not intervene to fix a given exchange rate, what happens considering expansion in monetary policy? In this model, the IS (equilibrium condition in the market for goods and services in an open economy) function is given as: $Y = c(Y - T) + I(i) + G + NX(e)$ and $\frac{M}{P} = L(i, Y)$ as the LM function (Fan and Fan, 2002). The balance of payment is the sum of the capital account $(KA = K_I - K_0)$ and the current account $(CA = X - M)$.

Increase in nominal money supply shift the LM curve to the right from LM_0 to LM_1, where an internal equilibrium is attain at point B (considering panel (a) and (b)), domestic income expands from initial Y_0 to Y_1, put downward pressure on the domestic interest from the initial i_0 to i_1 and in turn stimulate s a short term capital outflow, worsening the short term capital account. The lower interest rate reduces a net capital outflow $\{[K_I - K_0] < 0\}$ and the higher income increases imports $\{(X - M) > 0\}$. Thus, both the short run capital movements and increase in domestic income put downward pressure on the value of the home currency. Consequently, there is an incipient deficit in the balance of payments, resulting in depreciation of the domestic currency (e ↑) and a rightward shift of BP curve from BP_0 to BP_1. Depreciation boost exports and reduces imports (improve trade balance), which cause a rightward shift in the IS curve from IS_0 to IS_1. The rightward shift in the IS and BP curves continue until they intersect with the LM curve at a common point $c(i_2, Y_2)$, where equilibrium is attain (see Acheampong, 2008 and Mankiw, 2010).

There is general agreement among economists and policymakers that monetary policy works mainly through interest rates. When the central bank policy is tightened through a decrease in reserve provision, for instance, interest rates rise. Interest rate rise means that the banks have to adjust their lending rates upwards. The rise in interest rates leads to a reduction in spending by interest sensitive sectors of the economy, such as housing and consumer purchases of durable goods. Therefore, the cost of credit becomes high and, in most cases, becomes unaffordable reducing demand for credit.

Some economists and policymakers have argued that an additional policy channel works through bank credit (Keeton, 2001; Stiglitz and Weiss, 2001). In this view, monetary policy directly constrains the ability of banks to make new loans, making credit less available to borrowers who depend on bank

financing. Thus, in the credit channel, restrictive monetary policy works not only by raising interest rates, but also by directly restricting bank credit.

Empirical review

Syafri (2012) study analyzed the factors that affect the profit of commercial banks in Indonesia, using polling data from commercial banks listed on the Indonesia Stock Exchange between 2002 and 2011. Bank profitability was measuredbyreturnonassetsand results showed that loan to total assets, total equity to total assets and loan loss provision to total loan have positive effect on profitability.

The study by Frederic (2014) examined the factors responsible for determining the performance of domestic commercial banks in Uganda. The study used linear multiple regression analysis over the period 2000-2011 to analyze the data of all licensed domestic and foreign commercial banks. The study found that, management efficiency; asset quality; interest income; capital adequacy and inflation influence on the bank's performance in Uganda.

Abdurrahman (2010) empirically examined the role of monetary policy on economic activity in Sudan for the period which spanned between 1990 and 2004 and found that monetary policy had little impact on economic activity during the period under consideration. Mangani (2011) assessed the effects of monetary policy in Malawi by tracing the channels of its transmission mechanism, while recognising several factors that characterise the economy such as market imperfections, fiscal dominance and vulnerability to external shocks. Using vector autoregressive modelling, Granger causality, block exogeneity and innovation accounting analyses to describe the dynamic interrelationships among monetary policy, financial variables and prices. The studyestablished the lack of unequivocal evidence in support of a conventional

channel of the monetary policy transmission mechanism and found that the exchange rate was the most important variable in predicting prices.

Karimi and Khosravi (2010) investigated the impact of monetary and fiscal policies on economic growth in Iran using autoregressive distributed approach to co-integration between 1960 and 2006. The empirical results indicated existence of long-run relationship between economic growth, monetary policy and fiscal policy. The results further showed exchange rate and inflation as proxies for monetary policy have inverse impact on economic growth.

Buyinza (2010) investigated samples of 23 commercial banks profitability from 1999 to 2006 in Sub Sahara Africa countries. The study utilized panel data and the regression results revealed that capital, efficient expenses management, bank size, credit risk, diversified earning ability of the banks, per capital GDP, growth rate and inflation have significant and positive impact on banks' profitability. (Pinter, Ali, Akhtar, and Ahmed ,2011) examined the bank specific and macroeconomic indicators of 22 public and private sector commercial banks profitability from 2006 to 2009 in Pakistan. The research made use of multiple regression models and panel data estimation. The study found that bank size, operating efficiency, asset management and GDP had positive effect on banks' profitability. However, capital and credit risk had negative effect on banks profitability in Pakistan.

Saidu and Tumin (2011) investigated the performance and financial ratios on samples of four Malaysian and nine Chinese commercial banks from 2001 to 2007. The research made use of panel data and the regression results show that credit, capital and operating ratios have influence on the performance

of banks in China which is not true for Malaysia. The study found that liquidity and size of the banks do not influence the performance of the banks in both countries. (Khrawish, and Siam, 2011) investigated the determinants on samples of three Jordan Islamic banks profitability from 2005 and 2009. The multiple linear regression results show capital, bank size, financial risk, GDP growth rate, inflation, and exchange rate.

Ekpung, Udude and Uwalaka (2015) examined the impact of monetary policy on the banking sector in Nigeria. The study tried to ascertain the factors that influence the banking sector performance using bank's deposit liabilities as proxy for bank performance. They tested the null hypothesis of no significant relationship between bank deposit liabilities and chosen indices of banking performance, namely Exchange Rate (EXR), Deposit Rate (DR) and Minimum Discount Rate (MDR Results showed that overall; monetary policy had a significant effect on the banks deposit liabilities. meanwhile, on individual basis, they discovered that Deposit Rate (DR) and Minimum Discount Rate (MDR) had a negative influence on the banks deposit liabilities, whereas Exchange Rate (EXR) had a positive and significant influence on the banks deposit liabilities in Nigeria. Their conclusion therefore was that monetary policy plays a vital role in determining the volume of bank's deposit liabilities in Nigeria.

Olweny and Chiluwe (2012) explored the relationship between monetary policy and private sector investment in Kenya by tracing the effects of monetary policy through the transmission mechanism to explain how investment responded to changes in monetary. The study utilises quarterly macroeconomic data from 1996 to 2009 and the methodology draws upon unit

roots and cointegration testing using a vector error correction model to explore the dynamic relationship of short-run and long-run effects of the variables due to an exogenous shock. The study showed that monetary policy variables of government domestic debt and Treasury bill rate are inversely related to private sector investment, while money supply and domestic savings have positive relationship with private sector investment consistent with the IS-LM model. Based on the empirical results the study suggests that tightening of monetary policy by 1 % has the effect of reducing investment by 2.63% while the opposite loose monetary policy tends to increase investment by 2.63%.

Kimani (2013) studied the effect of monetary policy on the lending behaviors of Commercial Banks of Kenya. The study established that CBR, cash reserve ratio, open market operation and uncertainty caused by monetary policy changes influences lending behavior of commercial banks in Kenya. The study found statistical evidence to support the claim.

Flamini, Schumacher & McDonald (2009) found that the banks' profitability in Sub-Saharan Africa (SSA) are comparatively high than the other regions. Banks profitability study was conducted on the sample size of 389 banks in SSA and the findings revealed that the size of the banks, diversified banks activities and the private ownership plays a significant role in determining the higher returns on assets. "Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion. The results also indicate moderate persistence in profitability. The paper gives some support to a policy of imposing higher capital requirements in the region in order to strengthen financial stability."

Chuku (2009) studied the impact of monetary policy shocks on output and prices in Nigeria, using structural vector auto regression (SVAR) model and assumed that the unexpected changes in output and price within that period remained untraced by the central bank. The study conducted with the three major alternative policy instruments, broad money (M2), Minimum Rediscount Rate (MRR) and the real effective exchange rate (REER) revealed their effects on output and prices. "The quantity-based nominal anchor (M2) has modest effects on output and prices with a very fast speed of adjustment. While, innovations on the price-based nominal anchors (MRR and REER) have neutral and fleeting effects on output." They finally concluded that (M2) is the most influential instrument with the central bankers for the monetary policy implementation and suggested that quantity based nominal anchor should be given more weight age compared to price based nominal anchor. Hence, it is imperative to correctly identify the impact of monetary policy changes to facilitate superior policy making.

Sanusi (2002) noted that the role of the Central bank in regulating the liquidity of the economy which affects some macroeconomic variables such as the output, employment and prices cannot be over-emphasised. The Central Bank of Nigeria over the years has adopted different monetary policy management techniques to keep the economy in a stable state. Before the structural adjustment of 1986 which ushered in a period of financial deregulation, it adopted a system of direct control through the issue of credit guidelines and interest rate fixation but from the later part of the 1980s, it adopted indirect control system of management by resorting to open market operations, adjustment of legal reserves requirement and the rediscount rate. But

in all these, the attainment of the desired objectives of monetary policy has been affected by domestic and external environments which include fiscal dominance, underdeveloped nature of the financial markets, external debt overhang and volatility in oil price.

Onyeiwu (2012) studied the effect of Central Bank of Nigeria's monetary policies on selected macroeconomic variables: gross domestic product, inflation rate and balance of payment between 1981 and 2008. Using the Ordinary Least Squares Method (OLS) to analyse data, the result shows that monetary policy proxy by money supply exerts a positive impact on GDP growth and Balance of Payment but negative impact on rate of inflation. He recommended that monetary policy should facilitate a favourable investment climate through appropriate interest rates, exchange rate and liquidity management mechanism.

Hamdan and Masig (2008) tested the "hypothesis that in the context of a relatively developed banking system and effective monetary policy framework the speed of adjustment of the deposit rates would be faster than that of the lending rates in response to a change in monetary policy instrument such as the discount rates". This knowledge of the speed of adjustment is crucial for an effective transmission and implementation of a change in monetary policy instrument. The test of hypothesis on a set of industrial and developing countries based on the 'Auto-Regressive Distributed Lag' (ARDL) methodology, tends to suggest that the deposit rates adjust faster than the lending rates in most of the industrial countries as well as in those developing countries in which the banking system appears to be relatively more developed. The findings are

plausible and have strong policy implications for both the industrial and developing countries.

Rao (2006) investigated the impact of monetary policy on the banks profitability mainly in the financial sector of India by studying various instruments of monetary policy. The lending rates have been found to have positive relationship with banks' profits which indicates a rise in lending rates will increase the profitability of the banks. When the Bank Rate, SLR and CRR is included the regression coefficient is insignificant to explain the relationship between bank profitability and the monetary policy instrument in the case of public sector banks. It can be concluded that banking is still regulated and controlled in terms of a strict credit policy followed by the Reserve Bank of India to combat inflationary pressures.

Haiying-Pan (2012) studied the effects of regular increases in reserve requirement ratio (RRR) in china and found out that changing reserve ratio does not have any direct effect on controlling surplus liquidity, preventing inflation or controlling the lending activity. Further, RRR has a long-term but very weak and negative influence on money supply and loan scale and no effect on CPI.

Another research Sehrish Gul (2011) investigated the impact of bank- specific characteristics and macroeconomic indicators on bank's profitability in the Pakistan's banks for the period 2005-2009. It investigated the impact on major profitability indicators i.e. return on assets (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM) of assets, loans, equity, deposits, inflation, economic growth and market capitalization and has found strong evidence that both internal and external factors have a strong influence on the profitability of the banks. Banks with

higher margins of equity capital, deposits, loans and Total Assets are prone to earning higher profits. Accordingly, the macro factors also show a significant positive relationship with the bank profits.

Zarafat (2014) studied the macroeconomics factors that generates banks' profits and found that for the banks' profitability the growth of GDP must be in place in order to stimulate lending and borrowing activities, also real interest rate has no direct relationship with banks' profitability. It experimented the relationship and dynamic linkage between profitability of Malaysian commercial banks, expressed through return on assets (ROA) and macroeconomic variables which include real GDP growth, inflation (expressed through CPI) and real interest rates. It therefore justifies the economic theory, that economic growth increases bank profits through enhanced demand for business loans. These loans generate good returns to commercial banks, resulting in higher profits.

Almazari (2013) focused on the relationship between two determinants (capital adequacy and cost-income ratio) and the profitability of the commercial banks of Saudi Arabia. Bank profitability is affected by internal and external factors. The internal factors include: capital adequacy, bank size, liquidity, and the level of provisioning whereas external factors are lack of capital, the money supply, competition, government regulation, ownership, and inflation. Efficiency is measured by capital adequacy ratios (CARs) and cost income ratio (CIR), and bank's profitability is measured by ROA and ROE. It found that both have negative relationships with the profitability of the banks.

Rao and Somaiya (2006) investigated the impact of monetary policy on the profitability of banks in India between 1995 and 2000. The monetary

variables were banks rate, lending rates, cash reserve ratio and statutory ratio, and each regressed-on banks profitability independently. Lending rate was found to exact positive and significant influence on banks‟ profitability, which indicates a fall in lending rates will reduce the profitability of the banks. Also, bank rate, cash reserve ratio and statutory ratio were found to significantly affect profitability of banks negatively. Their findings were the same when lending rate, bank rate, cash reserve ratio and statutory ratio were pooled to explain the relationship between bank profitability and monetary policy instruments in the private sector.

Gul, Irshad and Zaman (2011) research was focused on examining the effect of bank specific and macroeconomic factors on bank profitability by using data of top 15 Pakistan commercial banks over the period 2005-2009. The Pooled Ordinary Least Square (POLS) method was used to investigate the impact of assets, loans, equity, deposits, economic growth, inflation and market capitalization on profitability, measured through return on asset (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM). The results found evidence that both internal and external factors have a strong influence on profitability.

Critique of Existing Literature

Monetary policy covers the monetary aspect of the general economic policy which requires a high level of co-ordination between monetary policy and other instruments of economic policy of the country. The effectiveness of monetary policy and its relative importance as a tool of economic stabilization varies from one economy to another, due to differences among economic structures, divergence in degrees of development in money and capital markets

resulting in differing degree of economic progress, and differences in prevailing economic conditions (Faure, 2007).

To achieve the desired stabilization in an economy, central banks use various monetary policy instruments which may differ from one country to another according to differences in political systems, economic structures, statutory and institutional procedures, development of money and capital markets and other considerations. Some of the commonly used monetary policies include: changes in the legal reserve ratio, changes in the discount rate or the official prime rate (Central Bank Rate), exchange rates and open market operations. In order to investigate the effect of monetary policy on commercial banks' performance a holistic approach is required rather than emphasizing on a single monetary tool an integrative approach is imperative in this regard.

Chapter Summary

This chapter focused on review of literature related to studies undertaken by other scholars in relation to effects of monetary policies on commercial bank's performance. It was divided into three sections. Section one gives an introduction of the topic. Section two covers the theoretical literature review on commercial banks' performance. The chapter ends by looking at each of the specific aspects: Central Bank Rate, Cash reserve ratio, Open market operations and how they would affect the performance of commercial banks.

CHAPTER THREE RESEARCH METHODS

Introduction

This chapter looks at the procedures that were espoused to achieve the objective of this study. The chapter essentially focused on how the whole study was done. Issues such as model specification, data sources, definitions of variables, estimations procedures, and justification for the inclusion of variables were covered by the chapter.

Research Design

Consistent with the objectives, the study employed the quantitative research design to find the relationship between profitability proxied by Return on Assets and several control variables in Ghana. As compared to qualitative design, the major strength of research design is how it take full advantage of replicability, objectivity, and generalizability of findings. Therefore, this design ensures that the researcher will set aside his experiences, discretions or perceptions, and biases to ensure objectivity in the conduct of the study and the deductions that would be drawn.

Theoretical Model Specification

The model specification for the study was informed by the reviewed literature on profitability and performance of universal banks. Review of the literature such as but not limited to Donia (2012); Yu and Gan (2010; Benyah (2010); Seetanah, Ramessur, and Rojid (2009); and Chinn and Ito (2006) informed the choice of a number of variables to specify the banking sector profitability model for Ghana.

To respond to the set objectives of the study, the researcher specified a model using profitability determinants as independent variables and return on asset as the dependent variable. The foundation of the econometric model was empirical literature and reviewed theory. The study adopted the linear regression model as put forward by Bonilla, Casasús, and Sala (2012). The model is presented as expressed in a functional form, it is represented below:

$$ROA = f(V) \quad (1)$$

where, ROA is Return on Asset proxying universal banks performance.

V = Vector of bank-specific and macroeconomic factors affecting banks profitability.

The equation provides an average relationship between the profitability of Banks and the set of explanatory variables and hence, the predicted profitability gives the average profit to banks conditioned on the impact of set of control variables.

Empirical Model Specification

By modifying the model used by Bonilla et al. (2012), we can estimate a model in which Banks Profitability is functionally linked to economic development and structure of the economy or some macro-economic variables. To explore the dynamic association among banks profitability and the variable of interest, monetary policy rate, together with control variables, we expressed equation 2 as seen below.

$$ROA = f(GPC, NPL, GPC, EXH, INF, MPR) \quad (2)$$

The functional model was transformed into a structural model as seen in equation (3)

$$ROA_t = f(.) = NPL_t GPC_t EXH_t INF_t MPR_t \varepsilon_t$$

(3) Using the logarithmic transformation of the variables in equation (3), the empirical specification of the model above can be written as seen in equation (4) below:

$$lnROA_t = \beta_0 + \beta_1 lnNPL_t + \beta_2 lnGPC_t + \beta_3 lnEXH_t + lnINF_t + \beta_6 lnMPR_t + \varepsilon_t \quad (4)$$

where; ROA = Return on Asset proxying Banks Profitability, β_0 = profitability intercept, GPC= Gross Domestic Product Per Capita, NPL = Non-Performing Loans, INF = Inflation rate, MPR = Monetary Policy Rate, while ε is the error term.

Data Description and Sources

Based on evidence from existing literature, this study identified seven main variables being Monetary Policy rate (MPR), Real Effective Exchange Rate (EXH), Return on Assets (ROA), Inflation (INF), Gross Domestic Product Per Capita (GPC) and Non-Performing Loans (NPLs) as factors affecting banks profitability. These variables are combination of bank-specific and macroeconomic variables that affect universal banks profitability.

Justification of the Inclusion of the Variables Bank Profitability (Return on Asset)

There are different ways one can explain bank performance, one of which is to look at the profit and loss account of different banks that make up the sector, this approach can be classified as microeconomic approach. On the other hand, one can look at bank performance by considering the aggregate bank total assets and liability statement in an economy. This however, can be

regarded as macroeconomic approach to bank performance. Bank profitability may reflect the risk taking behaviour of bank managements.

Banks with high profitability are less over stressed for revenue creation and thus less forced to engage in risk credit offering. However, inefficient banks are more likely to experience high level of problem loans since they are tempted to grant and to engage in more uncertain credits to defend their profitability and meet the prudential rules imposed by monetary authorities (Boudriga, Boulila Taktak, & Jellouli, 2009). Poor management can imply week monitoring for both operating cost and credit quality of customers, which will include high levels of capital losses (Haneef, Riaz, Ramzan, Rana, Hafiz, & Karim, 2012). Thus, ROA is considered as profitability indicators of bank in this study. ROA entails universal banks' after-tax net income to yearly averaged total assets.

Non-performing Loans (NPLs)

Nonperforming loans (NPLs) are loans that are outstanding both in its principal and interest for a long period of time contrary to the terms and conditions under the loan contract. Any loan facility that is not up to date in terms of payment of principal and interest contrary to the terms of the loan agreement is NPLs. Thus, the amount of nonperforming loans represents the quality of bank assets (Tseganesh, 2012).

Deterioration in asset quality is much more serious problem of bank unless the mechanism exists to ensure the timely recognition of the problem. It is a common cause of bank failure. Poor asset quality leads to non-performing loans that can seriously damage a banks' financial position having an adverse effect on universal banks' operation (Epure & Lafuente, 2015). It distressesthe

performance and survival of banks (Mileris, 2012). It is measured or indicated by the amount of NPLs to gross loans.

Gross Domestic Product GPC)

GDP is one of the macroeconomic indicators of the health of any country's economy. The GDP referred to in this study is the GDP growth, which is the macroeconomic measure of the value of economic output adjusted for price changes. Increasing GDP growth is usually associated with decreasing levels of NPLs (Beck, Jakubik & Piloiu, 2013). This is because a strong positive growth in GDP growth usually translates into more income which improves the debt servicing capacity of the borrower, which in turn contributes to lower NPLs and thereby increasing banks profitability (Khemraj & Pasha, 2009). From this literature, a positive relationship is expected between the two variables.

Inflation (INF)

There are four variables that lead to inflation: employment, consumption, production and unexpected increase in money supply. Increasing inflation rate can raise the nominal risk-free rate and discount rate in the equity valuation model. Unexpected inflation has a negative relationship with stock price (Liu and Shrestha, 2008). Tan and Floros (2012) found that there is a positive relationship between bank profitability, cost efficiency, banking sector development, stock market development and inflation in China.

Eita (2012) revealed that stock market returns and inflation in South Africa are positively related. The results also indicate that when all-share index is used as the measure of stock market returns, the causality is bi-directional. Lajeri and Dermine (1999) concluded that there was a negative impact of inflation on the market value of banks and the real economic activity and it

would reduce the expected returns. Modigliani, Franco and Cohn (1979) suggest that stock market investors are depended on the inflation illusion in the inflation illusion hypothesis. Feldstein (1980) explain that the relationship between the higher inflation and lower stock prices in the tax hypothesis. Fama (1981) also found a negative stock return-inflation relation. Unexpected changes in expected inflation would affect to the nominal contracts through discounting the cash flow.

Real Exchange Rate (EXH)

Joseph and Vezos (2006) indicated that exchange rate has a direct affect to the financial institutions revenues and costs. Economic theory suggests that the exchange rate has a very important influence in stock market by affecting cash flow, investment and profitability of the firms (Aydemir & Demirhan, 2009). Granger, Huang and Yang (2000) found that exchange rate lead stock price in Korea, however, stock price lead exchange rate in Hong Kong, Malaysia, Thailand and Taiwan. Mishra and Jain (2007) also found that due to the various and changeable international business and capital inflow and outflow, these changes would increase the investment decision uncertainly and the risk of the investment increasing as well.

Exchange rate becomes crucial for the financial sector. An appreciation of the cedi will attract inflows into Ghana's stock market all other things being constant. This will then raise the stock prices (Wang, 2010). Choi, Elyasiani and Kopecky (1992) found that exchange rate can affect the bank's profit though exposure to foreign translation risk.

Table 1: Expected Sign of Variables

Variable	*Expected Sign*	*Supporting Empirical Work(s)*
Non-Performing Loans (NPL)	Negative (-)	Lata (2014) and Roy (2015)
GDP Per Capita (GPC)	Positive (+)	Tomak et al (2013) and Ghosh, (2015)
Real Exchange Rate (EXH)	Negative (-)	Nkusu (2011)
Inflation (INF)	Positive (+)	Onyekachi and Okoye (2013) and (Haron & Azmi, 2004)
Monetary Policy Rate	Negative (-)	Haron (2004)

Source: Author's Construct, 2019

Data Sources

The data for this study is secondary data which were obtained from the World Development Indicators (WDI) 2017 edition, Database of Index Mundi, Database of FRED St. Louis, Database of IMF and the Bank of Ghana. The period selected for the study was from 1984 to 2016. Table 2 shows the sources and how the variable of interest together with the control variables was measured.

Table 2: Measurement of Variables

Variable	*Measurement*	*Data Source*
Return on Asset (ROA)	Commercial banks' after-tax net income to yearly averaged total assets.	Global Financial Development Database of the World
Inflation (INF)	Annual average inflation rate as shown by the consumer price index	Global Financial Development Datab the World Bank
Real Effective Exchange Rate (EXH)	Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.	World Development indicators by t World Bank
GDP Per Capita (GPC)	GDP per capita is gross domestic product divided by mid year population	Global Financial Development Data the World Bank
Non-Performing Loans (NPL)	The percentage of Bank nonperforming loans to gross loans.	Global Financial Development Data the World Bank
Monetary Policy Rate	End-of-Period Prime Rate	Global Financial Development Data the World Bank

Source: Author's Construct, 2019

Unit Root Test

It is very important to test for the statistical properties of variables when dealing with time series data. Time series data are rarely stationary in level forms. Regression involving non-stationary time series often lead to the problem of spurious regression. This occurs when the regression results reveal a high and significant relationship among variables when in fact, no relationship exist. Moreover, Stock and Watson (1988) have also shown that the usual test statistics (t, F, DW, and R2) will not possess standard distributions if some of the variables in the model have unit roots. A time series is stationary if its mean, variance and auto-covariance are independent of time.

The study employed a variety of unit root tests. This was done to ensure reliable results of the test for stationarity due to the inherent individual weaknesses of the various techniques. The study used both the Philips-Perron (PP) and the Augmented-Dickey Fuller (ADF) tests. These tests are similar except that they differ with respect to the way they correct for autocorrelation in the residuals. The PP nonparametric test generalizes the ADF procedure, allowing for less restrictive assumptions for the time series in question. The null hypothesis to be tested is that the variable under investigation has a unit root against the stationarity alternative. In each case, the lag-length is chosen using the Akaike Information Criteria (AIC) and Schwarz Information Criterion (SIC) for both the ADF and PP test. The sensitivity of ADF tests to lag selection renders the PP test an important additional tool for making inferences about unit roots. The basic formulation of the ADF is specified as follows:

$$X_t = \mu + \alpha X_{t-1} + \gamma t + \varepsilon_t \quad (5)$$

Subtracting X_{t-1} from both sides gives:

$$\Delta X_t = \mu + (1 - \alpha)X_{t-1} + \gamma t + \varepsilon_t \quad (6)$$

The t-test on the estimated coefficient of X_{t-1} provides the Dickey Fuller test for the presence of a unit-root. The Augmented Dickey Fuller (ADF) test is a modification of the Dickey Fuller test and involves augmenting the above equation by lagged values of the dependent variables. It is made to ensure that the error process in the estimating equation is residually uncorrelated, and also captures the possibility that X_t is characterized by a higher order autoregressive process.

Although the DF methodology is often used for unit root tests, it suffers from a restrictive assumption that the errors are *i.i.d*. Therefore, representing $(1-\alpha)$ by ρ and controlling for serial correlation by adding lagged first differenced to equation (6) gives the ADF test of the form:

$$\Delta X_t = \mu + \rho X_{t-1} + \gamma\tau + \sum_{i=1}^{\rho} \emptyset_i \Delta X_{t-i} + \varepsilon_t \quad (7)$$

Where X_t denotes the series at time t, Δ is the first difference operator, μ, γ, $\emptyset$ are the parameters to be estimated and ε_t is the stochastic random disturbance term.

The ADF and the PP test the null hypothesis that a series contains unit root (non-stationary) against the alternative hypothesis of no unit root (stationary).

That is:

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

H_0: $\rho \neq 0$ (X_t is stationary)

Estimation Technique

Autoregressive Distributed Lag (ARDL) Model

In order to establish and analyse the long-run relationships as well as the dynamic interactions among the various variables of interest empirically, the

autoregressive distributed lag cointegration procedure developed by Pesaran, Shin, and Smith (2001) was used.

The basis for using the ARDL to estimate the model centred on the following reasons: First, the ARDL cointegration procedure is comparatively more effective even in small sample data sizes as is the case in this study. This study covers the period 1984–2014 inclusive. Hence, the total observation for the study is 31 which is relatively small. Second, the ARDL enables the cointegration to be estimated by the Ordinary Least Square (OLS) technique once the lag of the model is known. This is however, not the case of other multivariate cointegration procedures such as the Johansen Cointegration Test developed by Johansen (1990).

This makes the ARDL procedure relatively simple. Lastly, the ARDL procedure does not demand pretesting of the variables included in the model for unit roots compared with other methods such as the Johansen approach. It is applicable regardless of whether the regressors in the model are purely I(0), purely I(1) or mutually cointegrated.

Following Pesaran, Shin & Smith (1999), as summarized in Choong, Yusop, and Liew (2005), the ARDL is applied by modelling the long-run equation (4) as a general vector autoregressive (VAR) model of order p in ROA_t. An expression of the relationship between the variables under study using the ARDL approach to cointegration is expressed as follows:

$$\Delta lnROA_t = \delta_0 + \emptyset lnROA_{t-1} + \alpha_1 lnNPL_{t-1} + \alpha_2 lnGPC_{t-1} +$$

$$\alpha_3 lnEXH_{t-1} + \alpha_5\ lnINF_{t-1} + \alpha_6\ lnMPS_{t-1} \sum_{i=1}^{\rho} \beta_1 \Delta lnROA_{t-i} +$$

$$\sum_{i=1}^{\rho} \beta_2 \Delta lnNPL_{t-i} \sum_{i=1}^{\rho} \beta_3 \Delta lnGPC_{t-i} \sum_{i=1}^{\rho} \beta_4 \Delta lnEXH_{t-i} +$$

$$\sum_{i=1}^{\rho} \beta_5 \Delta lnLIRS_{t-i} + \sum_{i=1}^{\rho} \beta_6 \Delta lnINF_{t-i} + \sum_{i=1}^{\rho} \beta_7 \Delta lnMPR_{t-i} + \varepsilon \quad (8)$$

Where, $\emptyset$ *and* α_i represent the short-run elasticities while β_i are the short-run elasticities.

Bounds test for Cointegration

The Autoregressive Distributed Lag (ARDL) Cointegration Test, otherwise called the Bounds Test developed by Pesaran et al. (2001) was used to test for the cointegration relationships among the series in the model. Two or more series are said to be cointegrated if each of the series taken individually is non-stationary with I(1), while their linear combination are stationary with I(0). In a multiple non-stationary time-series, it is possible that there is more than one linear relationship to form a cointegration. This is called the cointegration rank. The study therefore applies the ARDL cointegration technique developed by Pesaran *et al.* (2001) to the system of the six variables in the growth equation to investigate the existence or otherwise of long-run equilibrium relationships among the variables.

Having satisfied the criteria that the variables were a mixture of I(0) or I(1), the ARDL bounds test for cointegration is carried out. The ARDL Bounds testing procedure essentially involves three steps. The first step in the ARDL bounds testing approach is to estimate equation (4) by OLS in order to test for the existence or otherwise of a long-

run relationship among the variables. This is done by conducting an F-test for the joint significance of the coefficients of lagged levels of the variables.

The hypothesis would be:

$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = \theta_7 = 0$

$H_1: \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq \theta_7 \neq 0$

The test which normalizes on Return on Asset is denoted by

$F_{ROA}(ROA, GPC, NPL, EXH, \text{INF}, \text{MPR})$.

Two asymptotic critical values bounds provide a test for cointegration when the independent variables are I(d) (where $0 \leq d \leq 1$): a lower value assuming the regressors are I(0) and an upper value assuming purely I(1)regressors.

Given or established that the F-statistic is above the upper critical value, the null hypothesis of no long-run relationship is rejected regardless of the orders of integration for the time series. On the flip side, if the F-statistic falls below the lower a critical value, the null hypothesis is accepted, implying that there is no long-run relationship among the series. However, if the F-statistic falls between the lower and the upper critical values, the result becomes inconclusive.

In the second stage of the ARDL bounds approach, once cointegration isestablished the conditional ARDL $(p, q_1, q_2, q_3, q_4, q_5)$, the long-run model for ROA_t can be estimated as:

$$\Delta lnROA_t = \gamma + \sum_{i=l}^{\rho} \beta_{li} \Delta lnROA_{t-if-1} + \sum_{g-1}^{n} \beta_{2m} \Delta lnNPL_{t-m} + \sum_{g-1}^{n} \beta_{3g} \Delta lnGPC_{t-g} + \sum_{s-1}^{n} \beta_{5s} \Delta lnEXH_{t-s} + \sum_{w-1}^{n} \beta_{6w} \Delta lnINF_{t-w} + \sum_{y-1}^{n} \beta_{7y} \Delta INF_{t-y} + \mu_t \quad (9)$$

This involves selecting the orders of the ARDL ($p, q_1, q_2, q_3, q_4,$) model in the six variables using Akaike Information Criterion (Akaike, 1973).

The third and the last step in the ARDL bound approach is to estimate an Error Correction Model (ECM) to capture the short-run dynamics of the system.

Error-Correction Model (ECM)

The concepts of Error Correction Models (ECM) and cointegration are closely associated in time series analysis and often used together to characterize the relationships between the series being studied. In essence, it can be shown that, with re-parameterization, the error-correction model is a standard VAR in first differences augmented by error-correction terms. An Error-Correction Mechanism (ECM) is a way of combining the long run, cointegrating relationship between the level's variables and the short-run relationship between the first differences of the variables.

The principle behind the error-correction model is that there often exists a long-run equilibrium relationship between two economic variables. In the short-run, however, there may be disequilibrium. With the error-correction mechanism, a proportion of the disequilibrium is corrected in the next period. The error-correction process is thus a means to reconcile short-run and long-run behaviour.

The ECM generally provides the means of reconciling the short-run behaviour of a profitability variable with its long-run behaviour. The ECM is specified as follows:

$$\Delta lnROA_t = \gamma + \sum_{i=l}^{o} \beta_{li}\, \Delta lnROA_{t-i} + \sum_{f-1}^{n} \beta_{2f}\, \Delta lnNPL_{t-f} +$$

$$\sum_{g-1}^{n} \beta_{3g} \Delta lnGPC_{t-g} + + \sum^{n} \beta_{4w} \Delta lnLEXH_{t-w} + \sum^{n} \beta_{4r} \Delta lnLINF_{t-r} +$$

$$\sum_{k-1}^{n} \beta_{5s}\Delta lnMPR_{t-s} + \rho ECM_{t-1} + \mu_t \quad (10)$$

From equation (10), β_i represents the short-run dynamics coefficients of the model's convergence to equilibrium. ECM_{t-1} is the Error Correction term. The coefficient of the Error Correction term, ρ measures the speed of adjustment to obtain equilibrium in the event of shocks to the system. where ECT_{t-1} is the error correction term. The absolute size of the error term, ECT_{t-1}, determines the speed of adjustment of the model to long-run equilibrium when it is shocked Data Analysis

The study employed both descriptive and quantitative analysis. Charts such as graphs and tables were employed to aid in the descriptive analysis. Unit root tests were carried out on all variables to ascertain their order of integration. Furthermore, the study adopted the bounds testing approach of cointegration to obtain both the short and long-run estimates of the variables involved. All estimations were carried out using Econometric views Eviews 9.0 package.

Chapter Summary

This chapter developed and presented the methodological framework appropriate for conducting the study. The model was developed from the theoretical formulations of Banks profit performance. Annual time-series data on GDP per capita, non-performing loans rate, interest rate margin, inflation and real effective exchange rate and monetary policy rate from 1984 to 2016 was employed for the study. Stationarity test procedures using the ADF and PP tests were specified. Also, the ARDL and bounds testing to cointegration test procedures were specified.

CHAPTER FOUR RESULTS AND DISCUSSION

Introduction

This chapter presents and discusses the estimation results. The results of the descriptive statistics of the relevant variables, both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests, and Autoregressive Distributed Lag (ARDL) approach to cointegration was presented and discussed. The results was discussed in relation to the various hypotheses of the study.

Descriptive statistics

The study conducted descriptive statistics of the variables involved. The descriptive statistics include the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, sum, sum squared deviation and number of observations but discussion centered mainly in the location and the variability of the data. We observe from Table 3 that all the variables have positive average values and median.

The mean return on assets (ROA) averaged approximately 4 percent. Also, the average unemployment rate among Ghanaians over the study period was also approximately 4.8 percent. Monetary policy rate also averaged 25 percent over the study period. Also, the minimal deviation of the variables from their means as shown by the standard deviation gives indication of slow growth rate (fluctuation) of these variables over the period of consideration. The Jarque- Bera statistic which shows the null hypothesis that all the series are drawn from a normally distributed random process cannot be rejected for all the variables but GDP growth, unemployment rate (UNP), and Return on Asset.

Table 3: Descriptive Statistics of the Variables

	ROA	EXH	MPR	INF	NPL	GPC
Mean	2.8481	146.93	25.177	17.473	16.02	777.07
Median	1.8715	107.73	18.031	12.758	16.30	721.21
Max	9.2800	559.51	59.461	25.382	22.70	1251.4
Mini	-2.2300	69.459	10.5268	7.7418	6.400	551.63
Std. Dev.	2.1877	99.721	12.529	2.0010	4.398	198.40
Skew	0.8058	2.9669	1.1320	-0.6257	-0.378	1.0966
Kurtosis	4.8339	11.776	3.8368	2.4034	2.488	3.2302
J-Bera	7.7000	144.97	7.5253	2.4827	1.077	6.2815
Prob	0.0212	0.0000	0.0232	0.2889	0.583	0.0432
Sum	88.291	4554.9	687.50	386.68	496.6	24089.
SSD.	143.58	298333	4709.7	120.12	580.5	1180972.
Observation	35	35	35	35	35	35

Note: Std. Dev. represents Standard Deviation while Sum Sq. Dev. represents Sum of Squared Deviation.
Source: Author's Construct, 2019

But for inflation and non-performing loans, all of the variables are positively skewed implying that the majority of the values are less than their means.

Unit Root Test Results

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

For this reason, before applying the ARDL approach to cointegration, unit root tests be conducted in order to investigate the statistical properties of

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

The results of ADF and PP tests for unit root with intercept and trend in the model for all the variables are represented in Table 4 and Table 5 respectively. The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of the null hypothesis is based on the MacKinnon (1996) critical values as well as the probability values.

Table 4: Results of Unit Root Test with Intercept and Trend: ADF Test

Levels				Difference			
Variables	ADF-Statistics	Lag		Variables	ADF-Statistics		
	Lag LROA	-2.7716[0.0686]**	0				
	ΔLROA	-8.1256[0.0000]***	0				
	I(0) LNPL	-3.0622[0.0352]**	1				
	ΔLNPL	-2.5420[0.1112]	0				
	I(0)						
LMPR	-2.2563[0.1895]	1		ΔLMPR	-3.2189[0.0239]***		
0	I(1)						
LGPC	-2.0017[0.2853]	1		ΔLGPC	-4.8552[0.0029]***	0	I(1) LEXH
-3.9604[0.0442]**	1	ΔLEXH	-2.9080[0.0506]*	0	I(0) LINF	-3.8989[0.0252]**	
1	ΔLINF	-5.7068[0.0005]***	1	I(0)			

Source: Author's Construct, 2019

*Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and I(0) is the lag order of integration. The values in parenthesis are the P-values.*

Table 5: Results of Unit Root Test with Intercept: PP Test

Levels			First Difference		
Variables	PP-Statistics	BW	Variables	PP-Statistics	
LROA	-2.6280[0.0933]*	5	ΔLROA	-8.8734[0.0000]**	I(0)
LNPL	-1.6882[0.4246]	5	ΔLNPL	-2.6327[0.0925]*	I(1)
LMPR	-1.656[0.4481]	4	ΔLMPR	-3.4385[0.0135]***	I(1)
LGPC	-1.6708[0.4405]	4	ΔLGPC	-3.3303[0.0180]**	I(1)
LEXH	-1.1083 [0.2423]	5	ΔLEXH	-3.0192[0.0390]**	I(1)
LINF	-4.3029[0.0102]**	3	ΔLINF	-15.3249[0.0000]***	5 I(0)

Source: Author's Construct, 2019
*Note: ***, **, * indicates the rejection of the null hypothesis of non- stationary at 1%, 5%, 10% level of significance respectively, Δ denotes the first difference, BW is the Band Width and I(0) is the lag order of integration. The values in parenthesis are the P-values.*

From the unit root test results in Table 4, the null hypothesis of the presence of unit root or non-stationarity for some of variables in their levels cannot be rejected since the P-values of the ADF statistics are not statistically significant at the three conventional levels of significance. These variables were Return on Assets (ROA), Non-Performing Loans (NPLs), Monetary Policy Rate (MPR), real exchange rate (EXH) and inflation (INF). However, at first difference, the variables become stationary. This is because the null hypothesis of the presence of unit root (non-stationary) is rejected at 5 percent significant levels for all the estimates. Thus, they are stationary at levels with respect to the ADF test.

The PP test results for the presence of unit root with intercept in the model for all the variables were presented in Table 5. From the results, but for return on asset (ROA), which was stationary at 10 percent significant levels. the null hypothesis of the presence of unit root for majority of the variables in their

levels cannot be rejected since the P-values of the PP statistics are not statistically significant at any of the three conventional levels of significance

However, at first difference, the variables became stationary. This is because the null hypothesis of the presence of unit root (non-stationary) is rejected at either 1, 5 or 10 percent significant levels for all the estimates. Specifically, return on assets (ROA), GDP per capita (GPC) and inflation rate (INF) were significant at 5 percent level. Meanwhile, Monetary Policy Rate (MPR) and exchange rate (EXH) were stationary at 1 percent while Non- Performing Loans (LNPL) was stationary at 10 percent. The PP unit root test results thus revealed similar results to that of the ADF test, suggesting that most of the variables are integrated of order one, I(1).

It is therefore clear from the unit root results discussed that all the variables are integrated of order zero, I(0), or order one, I(1). Since the test results have confirmed the absence of I(2) variables, the ARDL methodology is used for estimation.

Cointegration Test Result (Bounds Test)

Since the focus of this study is to establish the relationship between monetary policy rate and universal banks' profitability, it was imperative to test for the existence of long-run relationship between these two variables within the framework of the bounds testing approach to cointegration. Given that the study employs annual data, a lag length of 2 for annual data was adopted in the bounds test. Pesaran, Shin, and Smith (1999) suggest a maximum lag of two for annual data in the bounds testing to cointegration.

After the lag length was adopted, an F-test for the joint significance of the coefficients of lagged levels of the variables was conducted. Thus, each of

the variables in the model is taken as dependent variable and a regression is run on the others. For instance, LROA is taken as the dependent variable and it is regressed on the other variables. After that another variable for instance interest rate margin is taken as the dependent variable and it is also regressed on the other variables. This action is repeated for all the variables in the model. When this is done the number of estimated regressions would be equal to the variables in the model. Pesaran et al. (1999) indicate that "this OLS regression in the first difference are of no direct interest" to the bounds cointegration test. It is however, the F-statistics values of all the regressions when each of the variables is normalized on the other which are of great importance. This F-statistics tests the joint null hypothesis that the coefficients of the lagged levels are zero. In other words, there is no long run relationship between them. The essence of the F-test is to determine the existence or otherwise of cointegration among the variables in the long run. The results of the computed F-statistics when LROA is normalized (that is, considered as dependent variable) in the ARDL-OLS regression are presented in Table 5.

From Table 6, the F-statistics that the joint null hypothesis of lagged level variables (i.e. variable addition test) of the coefficients is zero is rejected at 1 percent significance level. Further, since the calculated F-statistics for $F_{LROA}(.) = 5.5561$ exceeds the upper bound of the critical value of band (3.38), the null hypothesis of no cointegration (i.e. long run relationship) between profitability of banks and its determinant is rejected.

Table 6: Bounds Test Results for Cointegration

Critical Value Bound of the F-statistic: intercept and no trend (case II)

K	90% Level		95% Level		99% Level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
6	2.08	3.00	2.39	3.38	3.06	4.15

F-Statistics: F_{ROA}(LROA|LNPLLGPC,LEXH,LINF,LMPR)=5.5561***

Source: Author's Construct, 2019

This result indicates that there is a unique cointegration relationship among the variables in Ghana's Universal Banks' profitability model and that all the determinants of universal banks' profitability in Ghana can be treated as the "long-run forcing" variables for the explanation of profitability in Ghana. Since this study is based on portability theory, LROA is used as the dependent variable. Therefore, since there is existence of cointegration among the variables in the profitability model, we proceed with the cointegrating or long run estimation results (see Appendix A).

Long-run results (Return on Asset is dependent variable)

Table 7 shows results of the long run estimate based on the Schwartz Bayesian criteria (SBC). The estimated model passes the standard diagnostic test (serial correlation, functional form, normality and heteroscedasticity) as can be seen in Table 6. The coefficients indicate the long run elasticities.

Table 7: Long-Run Results

Regressor	Coefficient	Standard Error	T-Ratio
LEXH	0.4058***	0.0032	123.715
LINF	-0.2064	0.3452	-0.597
LMPR	0.1147**	0.0561	2.044
LNPL	0.3163**	0.1577	2.005
LGPC	0.2356	0.2598	0.906
CONS	-0.0950***	0.0226	-4.194

Source: Author's Construct, 2019

The results of the study show a positive relationship between return on assets and monetary policy rate. With a coefficient of 0.1147, which is significant at 10 percent, it means a 1 percent increase in monetary policy rates leads to an increase in universal banks performance by approximately 0.1 percent. The positive effect could be interpreted as an indication of profit- maximizing behaviour whereby banks with higher profitability relative to average assets are also inclined to charge higher borrowing rates relative to the deposit rates. A study by Ahokpossi (2013) showed that monetary policy rate has a positive influence on banks' profitability. However, the result contradicts European banks findings by Merceica et al., (2007) where inverse relationship was found between monetary policy rate and profitability. Other bank-level variations that more positively determine the monetary policy rates are, net interest income as a ratio of total income and the extent of operating cost. The higher banks' income share derived from interest income, the higher the spreads.

The coefficient of Real Effective Exchange Rate (EXH) also had positive effect on universal banks' profitability and is statistically significant at

1 percent significance level. The coefficient (0.4058) of exchange rate indicates that if the country's currency depreciates by 1 percent, universal banks' profitability measured by return on asset will increase by approximately 0.48 percent in the long run. Thus, as expected a depreciation of the domestic currency makes Ghanaian exports relatively cheaper and as such leads to increase in demand for exports and by extension economic performance whereas an appreciation of the domestic currency makes exports more expensive and as such reduces economic performance in the long run. The effect of this inward transaction which most often takes place through the universal banks (payments and currency trading) improves profit levels. The result supports Aksoy and Salinas (2006) findings that the overvaluation of the real exchange rate was an important factor limiting the supply response of trade reforms. They further argued that real depreciation/devaluation enhances a country's international competitiveness which translates to economic performance and by extension, a good financial performance of universal banks. The result is also in line with findings of Anwar and Nguyen (2010), Fidan (2006), and Majeed and Ahmad (2007).

The long run results for non-performing loans or bad debts is significant at the traditional 5 percent. The result shows that there exists a theorized negative relationship between universal banks' profitability and the level of NPLs. The NPL rate is the major indicator of commercial banks credit performance. It is the ratio of nonperforming loan to total loan and advances which measures the extent of credit risk of banks. With a coefficient of -0.3163, the results indicate that a 1 percent increase in the rate of non-performing loans leads to approximately 0.3 percent decline in the profitability of universal banks

in Ghana. The findings concur several studies including one carried out by Lata (2014) who found out that non-performing loans had an adverse effect on the banks profitability in Bangladesh. The outcome also concurs with Roy (2015) who found that non-performing loan is one of the major factors that influence banks profitability and it is statistically significant with a negative effect on net profit margin of listed banks in Dhaka. The result further agrees with Muasya (2009) who found that non-performing loans adversely affected the performance of banks in Kenya. Additionally, the results confirm the study by Chen, Li, Xiao, and Zou, (2014) who found that NPLs had a significant effect on ROA in European banks. In all, NPL rate is the major indicator of commercial banks credit performance.

Error Correction Model

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

ECM= LROA + [0.4058*LEXH + 0.1147*LMPR - 0.2064LINF + 0.3163*LNPL + 0.2356*LGPC - 0.0950]

Short-Run Estimates (Return on Asset is the Dependent Variable)

The short-run estimates were also based on the Schwartz Bayesian Criteria (SBC) employed for the estimation of the ARDL model are reported in Table 8. The standard regression statistics can be seen from Table 8. We observed that the adjusted R^2 was approximately 0.71. It can therefore be explained that approximately 71 percent of the variations in universal banks' profitability is

explained by the independent variables. Also, a DW-statistics of approximately 2 revealed that there is no autocorrelation in the residuals.

The results also showed that the coefficient of the lagged error correction term ECT (-1) carried the expected negative sign (-0.6015) and is statistically significant at 1 percent. This indicates that approximately 60 percent of the disequilibrium caused by previous years' shocks converges back to the long run equilibrium in the current year. According to Kremers, Ericsson, and Dolado (1992) and Bahmani-Oskooee (2001), a relatively more efficient way of establishing cointegration is through the error correction term. Thus, the study discerns that the variables in the model show evidence of moderate response to equilibrium when shocked or disturbed in the short-run.

Theoretically, it is debated that an error correction mechanism exists whenever there is a cointegrating relationship among two or more variables. The error correction term is thus obtained from the negative and significant lagged residual of the cointegration regression. The ECM stands for the rate of adjustment to restore equilibrium in the dynamic model following a disturbance. The negative coefficient is an indication that any shock that takes place in the short-run will be corrected in the long-run. The rule of thumb is that, the larger the error correction coefficient (in absolute terms), the faster the variables equilibrate in the long-run when shocked (Acheampong, 2007).

Table 8: Short-Run Results

Regressor	Coefficient	Standard Error	T-Ratio
D(LROA(-1))	0.7651***	0.1423	5.3759
D(LEXH)	0.4123***	0.0052	78.6667
D(LEXH(-1))	0.3177***	0.0579	5.4805
D(LINF)	-0.1243	0.1348	-0.9220
D(LMPR)	0.9416**	0.4274	2.2029
D(LNPL)	0.6231	0.9791	0.6364
D(LNPL(-1))	-0.2971**	0.1216	-2.4416
D(LGPC)	0.1219	0.6832	0.1784
ECT(-1)	-0.6015***	0.1063	-5.6559

R-Squared	0.7925	R-Bar-Squared	0.7127
S.E. of Regression	0.6395	F-stat. F (9, 20)	9.9329*** [0.000]
Mean of Dependent Variable	0.0277	S.D. of Dependent Variable	0.1854
Residual Sum of Squares	0.8905	Equation Log-likelihood	-44.031
Akaike Information. Criterion	2.1829	Schwarz Bayesian Criterion	2.7669
DW-statistic	1.9861		

Source: Author's Construct, 2019

Discussion on the impact of non-performing loans as well as several control variables on banks' profitability is presented below.

The variable of interest, monetary policy rate, revealed a significant positive effect on universal banks' profit levels over the study period. The short run dynamics show that an increase in the monetary policy rate by 1 percent improves profit performance by approximately 0.9 percent and is statistically significant at 5 percent level of significance. The result demonstrates that discernment of bankers in Ghana is that monetary policy rate has a significant positive relationship profitability. The result is also in line with that of Shakoor et al. (2014) who found that in Pakistan there was strong and positive correlation between monetary policy rate and commercial banks' profitability meaning that if the value of monetary policy rate is increased/decreased then as result, value

of bank profitability also increased/decreased. This result from our study is consistent with the work of Flannery *et al*. (1980) and Borio *et al.* (2017) who found a positive relationship between the level of monetary policy rate and the slope of the yield curve on the one hand, and bank profitability on the other. Additional studies which had a similar outcome include those of Flannery et al. (1980) in the USA, Okoye and Onyekachi (2013) in Nigeria and Haron (2004) who studied determinants of profitability of Islamicbanks.

Moreover, the coefficient of real effective exchange rate also had positive effect on return on asset and is statistically significant at 1 percent significance level. The coefficient (0.4123) of real effective exchange rate indicates that if the country's currency depreciates by 1 percent, universal banks profitability measured as return on asset will increase by approximately 0.41 percent in the short run. Moreover, in the previous year, real effective exchange rate has an approximate 0.3 influence of profitability. Thus, as expected a depreciation of the domestic currency makes Ghanaian exports relatively cheaper and as such leads to increase in demand for exports and by extension economic performance. Moreover, the universal banks are medium through which these transactions are facilitated. The result supports Aksoy and Salinas (2006) who argued that real depreciation/devaluation enhances/hinders a country's international competitiveness, financial sector competitiveness and leading to increase exports and foreign exchange supplies and, thereby, increasing official capacity to imports needed inputs for industrial production and therefore economic performance. The result is also in line with findings of Anwar and Nguyen (2010); Fidan (2006); and Majeed and Ahmad, (2007).

Besides, the results show that the coefficient of inflation rate (INF) is negative but statistically insignificant. However, the sign of inflation is negative signifying a deleterious influence on universal banks' profitability. High inflation affects the economy as well as the society significantly and adversely. Improper price regulation and imperfect information about aggregate price level causes inflationary situation in the economy. High and unpredictable inflation slows down the process of economic growth and hurts the economy and this by extension has deleterious impact on universal banks profitability (Afzal, Malik, Butt, & Fatima, 2013).

The results also showed that bad debts or non-performing loans was statistically significant at the traditional 5 percent level of significance. The result shows that there exists a theorized negative relationship between universal banks profitability and the level of NPLs. With a coefficient of - 0.2971 in the previous year, the results indicate that a 1 percent increase in the rate of non-performing loans leads to approximately 0.3 percent decline in the profitability of universal banks in Ghana. This outcome is in line with several studies including one carried out by Lata (2014) who found that non-performing loans had an adverse effect on the banks profitability in Bangladesh. The outcome also concurs with Roy (2015) who found that non-performing loan is one of the major factors of influencing banks profitability and it is statistically significant with a negative effect on net profit margin of listed banks in Dhaka. The result further agrees with Muasya (2009) who found that non-performing loans adversely affected the performance of banks in Kenya. Additionally, the results confirm the study by Chen, Li, Xiao, and Zou, (2014) who found that

NPLs had a significant effect on ROA in European banks. In all, NPL rate is the major indicator of commercial banks credit performance.

Post Estimation Tests Table 9: Diagnostic Tests

Test Statistics	Chi/F Version
Serial Correlation	F (2, 37) = 2.8275 [0.1908]
Functional Form	F (1, 38) = 2.9901[0.9257]
Normality	CHSQ(2) = 0.1720[0.9175]
Heteroscedasticity	F (8, 20) = 0.8840 [0.5826]

Source: Author's Construct, 2019

Table 9 reports the results of the diagnostic test for the estimated ARDL model. From the table, the results show that the estimated model passes the Langrangean multiplier test of residual serial correlation, Functional Form Misspecification based on the square of the fitted values, Normality based on the Skewness and Kurtosis of the residuals and heteroscedasticity test based on the regression of squared residuals on fitted values. The tests as reported in Table 9 indicate that the estimated model passes the Langrangean multiplier test of residual serial correlation among variables. Also, the estimated model passes the tests for Functional Form Misspecification using square of the fitted values. The model also passed the Normality test based on the Skewness and Kurtosis of the residuals. Thus, the residuals are normally distributed across observations. Finally, the estimated model passes the test for heteroscedasticity test based on the regression of squared residuals on squared fitted values (see Appendix B).

Specifically, Table 9 shows the Serial Correlation LM test for the presence of autocorrelation. The result of the test shows that the p-value of 0.1908 which is about 19 percent greater than the critical value of 5 percent. This shows the absence of autocorrelation. The Heteroscedasticity test above shows that the p-value of about 0.5826 which is approximately 58 percent more than the critical value of 5 percent. This shows that there is no evidence of heteroscedasticity since the p-value are considerably in excess of 5 percent and conclude the errors are not changing over time. Also, the Ramey RESET test shows a p-value of approximately 93 percent (0.9257) and this is greater than the critical value of 5 percent. This shows that there is no apparent non-linearity in the regression equation and it would be concluded that the linear model is appropriate.

Stability Tests

Pesaran and Pesaran (1997) suggest that the test for the stability for parameters using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) plots be conducted after the model is estimated. This is done to eliminate any bias in the results of the estimated model due to unstable parameters. Also, the stability test is appropriate in time series data, especially when one is uncertain about when structural changes might have taken place.

The results for CUSUM and CUSUMSQ are depicted in Appendices C and D respectively. The null hypothesis is that coefficient vector is the same in every period and the alternative is that it is not (Bahmani-Oskooee & Nasir, 2004). The CUSUM and CUSUMSQ statistics are plotted against the critical bound of 5 percent significance level. According to Bahmani-Oskooee and

Nasir (2004), if the plot of these statistics remains within the critical bound of the 5 percent significance level, the null hypothesis that all coefficients are stable cannot be rejected.

The plot of CUSUM for the estimated ARDL model. The plot suggests the absences of instability of the coefficients since the plots of all coefficients fall within the critical bounds at 5 percent significance level clearly showing convergence. Thus, all the coefficients of the estimated model are stable and therefore we can say that the coefficients are not changing systematically over the period of the study (see Appendix C).

Also, the plot of CUSUMSQ for the estimated ARDL model. The plot also suggests the absences of instability of the coefficients since the plots of all coefficients fall within the critical bounds at 5 percent significance level. Thus, all the coefficients of the estimated model are stable over the period of the study in the sense that they are not changing erratically (see Appendix D).

Chapter Summary

This chapter examined the time series properties of the data used for estimation and also presented and discussed the results. Unit root test was conducted by employing both the ADF and the PP techniques showed that all the series had to be differenced once to achieve stationarity. The implication is that all the series are integrated of order zero $I(0)$ and one, $I(1)$. The presence of non-stationary variables implies the possibility of the presence of a long-run relationship, which the study verified using bounds testing approach to cointegration.

The results indicated the presence of cointegrating relationship between monetary policy rate and universal banks profitability. Whereas GDP

per capita, lag of return on asset and monetary policy rate exerted positive and statistically significant impact on profitability, inflation together with lag of exchange rate proved otherwise. The results of the ECM showed that the error correction term for return on asset did carry the expected negative sign.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter summarises, concludes and gives policy recommendations emanated from the study for the consideration of planners and managers of the economy. The aim is to show the major findings in the study and also suggest policy recommendations as to the way forward to increase a steady and sustainable universal bank performance. This chapter first summarises the findings of the study and then concludes the major findings of the study before prescribing policy recommendations.

Summary

The focus of this study was to investigate the relationship between monetary policy rate and profitability of universal banks.to determine if a long- run or short-run relationship exists among variables. In sum, the study examined monetary policy rate and profitability of universal banks. Together with some control variables using an Auto Regressive Distributed Lag Model that was developed by (Pesaran et al., 2001)

In the empirical literature analysis reviewed, the study largely explored the relationship between monetary policy rate, non-performing loans, universal banks' profitability. It was clear that the bulk of the literature surveyed produced mixed results on the relationship between non-performing loans and banks profitability.

In order to estimate the long-run relationship and short-run dynamic parameters of the model, the Autoregressive Distributed Lagged Model (bounds testing) approach to cointegration was employed. The estimation process was

started by testing for the stationarity properties of the variable using the Augmented-Dickey Fuller (ADF) and Phillips-Peron test statistics. The unit roots results suggest that all the variables were stationary after taking first difference with a constant under the ADF test and Philips-Peron test statistics. The study then proceeded to examining the long-run and short-run relationships between monetary policy rate and profitability of universal banks. The bounds tests results revealed that there is evidence of a long-run relationship between monetary policy rate and commercial banks profitability

The short-run and long-run results revealed that monetary policy rate, GDP per capita and the real effective exchange rate have a positive and significant influence on universal banks profitability. However, non-performing loans and inflation had a negative and statistically significant impact on universal banks profitability.

The existence of a long-run relationship among monetary policy rate and profitability of universal banks is further confirmed by a negative and statistically significant coefficient on the lagged error correction term and the size of this coefficient suggest that, the disequilibrium caused by previous years' shocks converges back to the long-run equilibrium in the current year.

The diagnostic test results also show that the model passes the test of serial correlation, non-normal errors and heteroscedasticity as well as the functional form. The graphs of the cumulative sum of recursive residual (CUSUM) and the cumulative sum of squares of recursive residual (CUSUMSQ) showed that there exists a stable relationship between universal banks profitability, non-performing loans, and the selected macroeconomic variables used for the study.

Conclusions

The study empirically examined the impact of monetary policy rate on universal banks profitability using Ghanaian data set for the period 1984 to 2016. The empirical evidence revealed the following findings: First, both the long-run and short-run results found statistically significant positive effects of monetary policy rate and exchange rate on universal banks' profitability. In addition, the growth of GDP per capita enhances the profitability of universal banks in Ghana. However, increasing levels of non-performing loans and previous year's exchange rate proved petrifying to universal banks' performance. Moreover, the long run results also showed favourable impacts of monetary policy rate, GDP per capita as well as exchange rate on universal banks profitability. The variable of interest, monetary policy rate had a positive relationship with universal banks profitability though the former is only significant at 10 percent level of significance and the latter, 1 percent level of significance.

Recommendations

Based on the findings from the study, the following recommendations are proposed.

Monetary policy rate has a significant impact on the level of ROAs however, higher prime rates could make commercial banks credit distressed. Consequently, to minimize such problems, the Bank of Ghana should set reasonable policy rates to enable credible financial institutions access funds for investment and money creation

In a bid to ensure and improve universal banks' profitability, it is strongly recommended that the management of universal banks and loan officers should always give a serious attention to the health of asset quality of banks specifically loan performance for prevention of loans loss. Besides, loan officers should provide financial counselling to the borrowers on the wise use of loan and should make decision on timely fashion to meet their needs. If so, the banks management on asset

utilization is improved and then reduces the level of non-performing is more likely to reduce.

Lastly, the researcher recommends that universal banks step up in addition to designing and implementing new loan recovery strategies and policies. The Spreading effect in NPL has a negative impact on managing it. Therefore, universal banks should take serious measures when a customer is reluctant in paying the loan while additional collateral is required when the value of the previous has decreased. Guarantors who are economically sound are the only ones universal banks should accept when it comes to giving out credit to clients.

Limitations

The major drawback to this study was the availability of data which is common to Sub-Saharan African countries. We could not use large sample size which was due to unavailability of data. Moreover, this study used the ARDL approach to cointegration and one major limitation with the method is that it is sensitive to both model specification and lag length selection. The selected lag length has implications for the outcome of the cointegration.

Future Direction of Research

It is suggested that for future research on this work, other researchers can expand the sample size and include other macroeconomic variables or bank specific factors that are not considered in this model. This can help improve and identify some variables that are crucial to universal banks profitability.

Finally, instead of looking at the impact of monetary policy rate on universal banks profitability, one could look at the performance of universal banks in monetary targeting and non-monetary targeting regimes.

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APPENDICES APPENDIX A

ARDL Bounds Test

Date: 07/01/18 Time: 09:53 Sample: 1984 2016

Included observations: 31

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
5.55616335		
F-statistic	630303	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

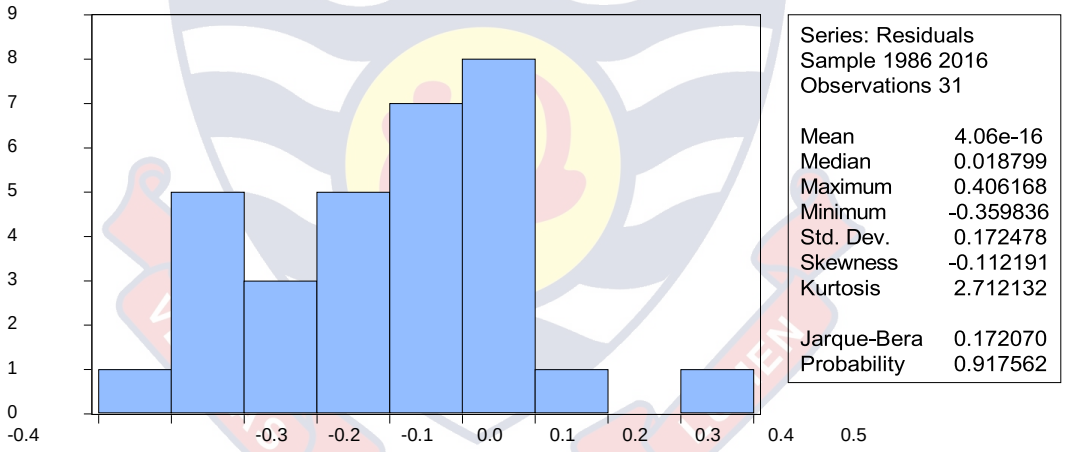
APPENDIX B

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.827547	Prob. F(2,15)	0.190
Obs*R-squared	8.487394	Prob. Chi-Square(2)	0.014

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.884080	Prob. F(13,17)	0.582
Obs*R-squared	12.50425	Prob. Chi-Square(13)	0.486
Scaled explained SS	3.219137	Prob. Chi-Square(13)	0.997



Ramsey RESET Test Equation: UNTITLED

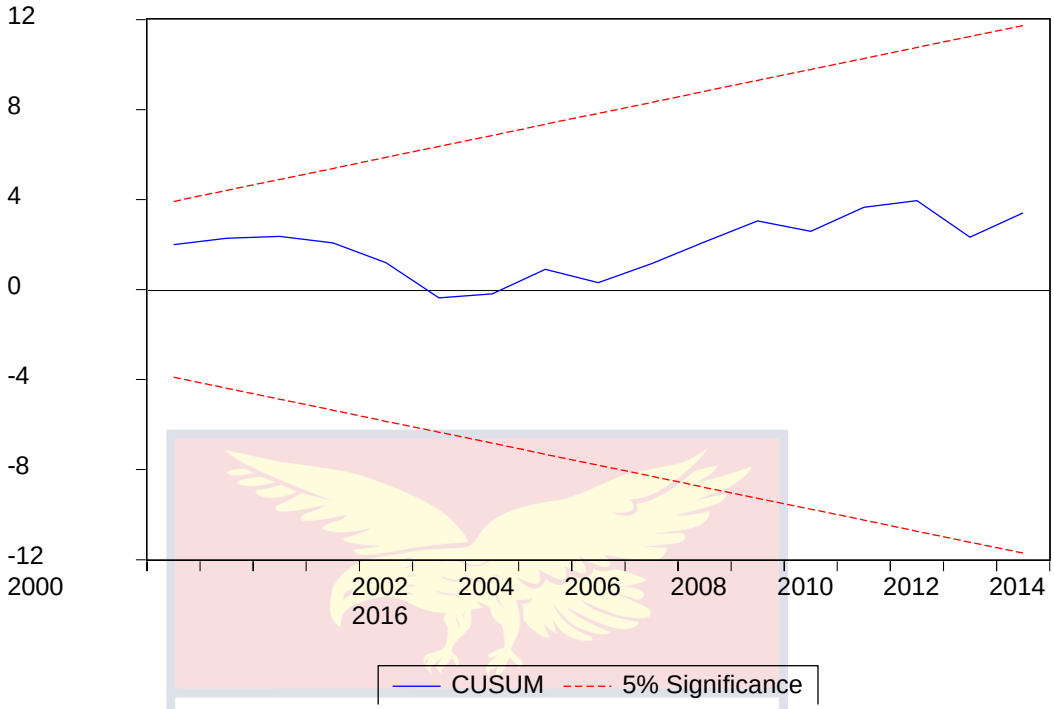
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.005468	21	0.9957
F-statistic	2.99E-05	(1, 21)	0.9957

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	4.09E-06	1	4.09E-0(
Restricted SSR	2.875818	22	0.13071(
Unrestricted SSR	2.875813	21	0.13694(

APPENDIX C



APPENDIX D