

UNIVERSITY OF GHANA

**THE EFFECT OF MONETARY POLICY ON ECONOMIC GROWTH IN THE
ECOWAS COUNTRIES**

BY

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INTEGRI PROCEDAMUS

DECLARATION

I, TSATSU DZISAH hereby declare that this thesis is the original research undertaken by me under the guidance of my supervisor. Neither the whole nor a part of this thesis has been presented for another degree elsewhere. All references used in this work have been accordingly acknowledged.

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TSATSU DZISAH

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DATE

CERTIFICATION

I hereby certify that this dissertation was supervised according to the laid down procedures of the university.

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DR. SAINT KUTTU

DATE

(SUPERVISOR)

DEDICATION

This long essay is dedicated to my family and friends for their support through this study.

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My utmost gratitude goes to God Almighty for His grace and mercies. I also acknowledge with immense gratitude the role of my supervisor Dr. Saint Kuttu in guiding me as I work on this dissertation.

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LIST OF ABBREVIATIONS

ECOWAS	Economic Community of West African States
GDP	Gross Domestic Product
IMF	International Monetary Fund
OLS	Ordinary Least Squares
WAMZ	West Africa Monetary Zone
WDI	World Development Indicator

ABSTRACT

An effective monetary policy mechanism ensures general macroeconomic stability which can foster private sector development an engine of growth. A sustained economic growth provides employment, income and tax revenues, which reduces poverty. Despite the number of studies on monetary policy and economic growth, there are however disagreements with regards to the impact of monetary policy on economic growth. Whiles some researchers argue that money supply determines economic growth at certain times, others believe that some other factors are significant contributors to economic growth hence are doubtful of the role money supply play in economic development.

This study therefore empirically explored the effect of monetary policy on economic growth in ECOWAS countries. Data for this study was sourced from World development indicators, for 14ECOWAS countries covering the period 2000-2017. The model for the study was estimated using the panel regression techniques. The study found that money supply, exchange rate, interest rate and gross fixed capital formation has a significant effect on economic growth of ECOWAS countries. Whilst the exchange rate and interest rate influence economic growth of the ECOWAS countries negatively, money supply and gross fixed capital formation relates to economic growth positively.

The study therefore recommends that, the Central Banks of the ECOWAS countries should strengthen the monetary policy accountability and credibility to maintain a short, medium, and long-run focus on improving their Monetary Policy frameworks. This can be done by obtaining the optimal money supply that would sustain economic growth in these countries.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

It has long been argued that monetary policy play a critical role in every economy. The effect of monetary policy in an economy has been a critical research area for economists (Christiano, Eichenbaum and Evans, 1994; Bernanke and Blinder, 1992). Generally, monetary policy involves the use of interest rate and money supply to affect the level and movement of national income (Mukherjee, 2007). According to Osinubi (2006), monetary policy is the blend of measures instituted to regulate the supply, cost and value of money within an economy. Monetary policy also works to achieve stable and sustainable price level, maintain balance of payment and stable exchange rate as well as induce economic growth in the economy (Carlin and Soskice, 2006; Agbonlahor, 2014). Thus, an effective monetary policy mechanism ensures general macroeconomic stability. This has the tendency of fostering private sector development, which is the engine of growth.

Economic growth denotes a sustained increase in Gross Domestic Products over time (Mukherjee, 2007). A sustained economic growth is imperative for one major reason; it provides employment, income and tax revenues, which reduces poverty (Dollar et al., 2013). For this reason, studies into the drivers of economic growth have preoccupied researchers for decades. (see Solow, 1956; Romer, 1986; Rebelo, 1991; Barro, 1997; Rogers, 2003; and Oosterban et.al, 2002). Growth of developing countries, particularly

those of sub-Saharan Africa have been irregular (Fabyan, 2009). This has engrained poverty in these countries. The story is not different in small regions such as West Africa (Fabyan, 2009).

The relationship between economic growth and monetary policy has been on the table of most researchers for decades. This is as a result of some disagreement among economist with regards to the effect of money supply on the growth of an economy. Whereas some economist growth holds the view that the supply of money at given time in an economy determines economic growth (Matheson, 1980; Levine, 1997), others are doubtful of the role money supply play in an economy because they believe other factors may contribute significantly to economic (Robinson, 1952; Fry, 1997).

West Africa is a sub region of the African continent with eighteen countries¹. The Economic bloc of the region is termed the “Economic Community of West African States (ECOWAS)”. The ECOWAS economic bloc comprises of fourteen countries². However, due to the persistence of colonial structures, the West African sub region is further grouped into Anglophone³ and Francophone⁴ countries. The Francophone economic integration is a customs and monetary union. This economic integration, which has existed for about two decades, was created to deepen economic integration through the usage of a common currency, called the CFA franc (Fabyan, 2009).

¹ Nigeria, Ghana, Sierra Leon, Benin, Guinea, Guinea-Bissau, Liberia, Burkina Faso, Gambia, Ivory Coast, Togo, Niger, Cape Verde, Senegal, Sao Tome, Saint Helena, Mauritania and Mali.

² Benin, Ghana Burkina Faso, Senegal, Ivory Coast, Mali, Guinea-Bissau, Niger, Togo, , Gambia, Sierra Leone, Nigeria, Guinea, and Liberia.

³ Ghana, Nigeria, Sierra Leon, Liberia, Gambia and Guinea

⁴ Benin, Mali, Burkina Faso, Guinea-Bissau, Ivory Coast, Niger, Togo and Senegal

Similarly, to foster economic integration among the Anglophone countries, the West African Monetary Zone (WAMZ) was created in the early 2000s to create a common currency for trade purposes. However, the goal of this common currency is yet to materialize, as member countries are yet to meet the convergence criteria imposed on member countries by the West African Monetary Institute (Fabyan, 2009).

The Central Banks of the WAMZ countries implement different kinds of monetary policy strategies, though their prime objective is the achievement of price stability in their economies. The dominant monetary policy strategies in these countries include, monetary aggregate targeting, exchange rate targeting and Inflation targeting (West Africa Monetary Institute, 2013). Liberia implements exchange rate targeting whilst Ghana makes use of the Inflation targeting framework. Nigeria with the other countries use monetary targeting framework. With the exception of Liberia, the remaining WAMZ countries' central banks undertake monetary policy decisions through their Monetary Policy Committees. For Liberia, the Board of Directors of the Liberia Central Bank undertakes monetary policy decisions.

1.1 Problem Statement

ECOWAS countries control a significant proportion of the economy of Sub-Saharan. For instance, in 2018 the share of ECOWAS countries GDP in the total Sub-Saharan Africa GDP was 45 percent (Africa Development Bank Report, 2017). Within the West African sub region the Economies of Nigeria and Ghana contribute over 75 percent of the GDP of the sub region. However, the economic growth of the countries in this group has been

slow in recent years (Ahmad et al., 2016). Due to the economic size and structure of these economies, a sustained growth in their production capacities would go a long way to increase employment, increase aggregate incomes, as well as reduce poverty in the sub-region. Again, this sustained growth will lead to the implementation of the single currency (Eco).

Despite this economic potential in the ECOWAS Countries, little research works have been done to uncover the typical variables that influence the economic growth of these countries from the monetary policy context. (see the West Africa Monetary Institute, 2013). The few studies conducted in this area are county specific and are thus unable to provide clear information of the monetary variables that driven growth in ECOWAS countries. Given the nature of these studies, time series data dominate their analyses, which do not capture the “panel effects” of the ECOWAS countries together. (see Onyeiwu, 2012; Adefeso & Mobolaji, 2010; Fosu, 2015; Bawumia, & Abradu, 2013). This study bridges this gap of country specific based studies to pooling of the data of the ECOWAS countries and analyzing with a pooled log-linear regression model.

1.2 General Objectives

The general of the study is to investigate the effect of monetary policy on the economic growth of ECOWAS Countries.

1.2.1 Specific Objectives

The specific objectives are:

- i. To examine the effect of money supply and inflation rate on economic growth of ECOWAS Countries.
- ii. To evaluate the effect of interest rate and exchange rate on economic growth of ECOWAS Countries.

1.3 Research Questions

Based on the foregoing, the following research questions arise:

1. What is the effect of Money Supply and inflation rate on economic growth of ECOWAS Countries?
2. What is the effect of interest rate and exchange rate on economic growth of ECOWAS Countries?

1.4 Significance of the Study

The study is significant in three main respects. Identification of the variables that influence economic growth in the sub region will help policy makers (governments) of these countries to advance monetary policies that would expand output in the region. Results of the study would also add to the knowledge stock of development institutions such as ECOWAS and the West Africa Monetary Institute in the advancement of their economic policies in the sub-region. Finally, finding of the study will extend the empirical literature on monetary policy in the sub-region.

1.5 Organization of the Study

The study is arranged five chapters. The first chapter introduces the study. Issues discussed under chapter one includes the problem statement, the background of the study, research questions, the objectives of the study, the study significance. Chapter two reviews the theoretical and empirical literature on monetary policy and economic growth. Chapter three provides a detailed theoretical framework and methodology for the study. It outlines the approach or research design and data sources. Chapter four provides a presentation of the analysis of data and a discussion of the analyzed data whilst chapter five provides a summary, conclusion and recommendation of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the theoretical and empirical literature in relation to the subject of the study. Specifically, it highlights literature on economic growth and monetary policy. The chapter begins with the theoretical literature followed by empirical studies. Some sub-topics in the empirical literature include monetary policy, economic growth and the impact of monetary policies on economic growth.

2.1 Theoretical Review

The impact of monetary policy on the performance of an economy can be explored through different channels. According to Dimitrijevic et al (2001) these channels can be classified under the monetarist and the Keynesian perspective. The monetarist perspective deals with the Pigouvian and Friedman sequence.

The Pigouvian sequence concentrates on the effect of price elasticity. This sequence maintains that an increase in employment, consumption, aggregate and real GDP is as a result of a decrease in the price level which increases wages. From the Pigouvian's perspective, money plays no significant role with a self-balancing mechanism despite the fact that the circulation of money in an economy suppresses prices in the market.

The Friedman sequence however is slightly different from the Pigouvian view. Similar to the Pigouvian sequence, the Friedman sequence believes in liberal economic policies

nonetheless in the short run with regards to the effect of money supply on nominal GDP growth. In summary, the Friedman sequence is that “money infused into the economy at a constant rate (velocity), results in the reduction of both nominal and real interest rates, and real GDP growth, as long as the money supply in the long-run is adjusted to the real GDP growth” (Friedman, 1974). Friedman and Schwartz (1963) noted that an increase in money in circulation, reserves by the commercial banks and the ability to create reserves through the multiplier is as a result of an expansionary open market operation.

The Keynesian sequence maintain that in periods of recession increasing money supply cause a decline in the interest rate leading to an increase in investments and aggregate demand. The Keynesians believe that a change in the stock of money boost financial sector activities which effect some major macroeconomic variables such as investment, interest rates, employment and output. In addition, Modigliani, and Miller (1963) presented the concept of capital rationing and concluded the monetary policy transmission is affected by the willingness of banks to lend.

Money Demand

Monetary policy can be traced back to Irving fisher (Fisher, 1912). Fisher’s equation of exchange serves as the means through which the quantity theory of money is explained.

The quantity theory of money is in two forms.

$$Mv = py(1)$$

$$M = kpy(2)$$

Equation (1) is the income version, where: v is the velocity of money; M is money supply; y is the real value of aggregate output (gross domestic product) and p is the general price level. This theory holds the assumption that in the short run velocity is constant and aggregate output is at full employment as such the movement in price level is caused by the changes in money supply.

The Cambridge version (equation 2), maintains that money with constant purchasing power (real money demand), is proportional to the real GDP expressed by coefficient k , and equal to the reciprocal value of income velocity of money ($k=1/v$).

Taking the logarithmic transformation and differentiating according to time, the following equations are derived below:³

$$\pi = m_s - y_r \quad (3)$$

$$M_s P = M_d P \quad (4)$$

The above equations express all the parameters as growth rates, and take into account the equality in balance of supply and money demand. This stems from the Monetary Rule of Friedman which states that the difference between the rate of growth of the supply money (also equivalent to the rate of growth rate of money demand) and the growth rate of the physical volume of production is the inflationary rate. Therefore, price levels do not increase in an economy that has its growth rate of the money supply to be the same as the growth rate of the physical volume of production. However, if the rise in money supply exceeds the production growth rate, there will be a rise in the price level leading to inflation.

2.2 Tools of Monetary Policy

The monetary policy instruments are impartial tools which the central banks use to influence money supply in an economy. These instruments are used to either increase the money supply or decrease the money supply to boost economic activities or control inflation. Some of the monetary policy instruments include Open Market Operation (OMO) Discount rate and the reserve required ratio. An open market purchase, a reduction in the discount rate and a reduction in the require reserve ratio signals an expansionary monetary policy. Whiles an open market sale, arise in the discount rate and a rise in the require reserve ratio signals a contractionary monetary policy.

2.2.1 Open Market Operation (OMO)

Open Market Operations has to do with the purchase or sale of government securities in the open market. This is done on the basis of the state of the economy. In periods of inflation, an open market sale is appropriate whereas an open market purchase help in periods on deflation. The effect is that when the monetary authorities sell securities to the market banks reserve decline and when they buy banks reserves increases. In this way open market operations reduce or enhance the banking system's ability to create credit and hence monetary control in an economy with well-developed money and capital markets.

2.2.2 Discount Rate

Commercial banks can fall on the central bank when they are in need of reserves. The rate of interest the central bank or the monetary authorities charge the commercial banks when the loan extended to them are known as the discount rate. The central bank creates

liquidity and rise investment by reducing the discount rate. The reduction in discount rate cause a decline the interest rates the commercial banks charge on borrowed funds. This action makes borrowing attractive leading to liquidity expansion and an increase in investment. Central bank also increases the discount rate to reduce the supply of money. An increase is the rate may be aimed at reducing inflation by reducing the supply of money.

2.3.2 Reserve Requirement (Reserve Ratio)

The reserve requirement otherwise known as the reserve ratio can be manipulated by monetary authorities to increase or reduce the supply of money. These is achieved the through the banking system. The loan making ability and lending position of the commercial banks are affected when there is a change the required reserve. In this regard the reserve requirement is severs as a tool for prudential regulation and also for managing liquidity. The reserve requirement is computed as apportion of the total deposit liabilities. Reserve requirement is one of the most powerful instruments of monetary control. A change in the requirement reserve ratio increase or decreases the ratio by which the banking system can increase deposit through the multiplier effect. If the required reserve ratio increases, it thereby reduces the liquidity position of the banking system. This makes less money available hence a reduction in the money supply. The central bank can reduce the required reserve ratio in order to make more money available in an economy.

2.2 Empirical Review

Studies on the relationship between economic growth and monetary policy can be traced back to the 1950s. Similar studies have concluded a strong positive relationship between monetary policy and economic growth both in developed and developing economies. Some of these studies include Cagan (1956), Friedman et al. (1963), King and Levine (1993), and more recently Irfan and Ume-Amen (2011), Anowor et al. (2016). Some studies however, examined the relationship between inflation and economic growth (Khan, & Schimmel pfennig 2006; Kearney & Chowdhury, 1997).

Anowor et al. (2016) examined the impact of monetary policy on economic Growth of Nigeria. Employ a time series data that span between 1982 and 2013 with interest rate, cash reserve ratio and monetary policy rate as the monetary policy tools. The authors used Error Correction Model, and found that cash reserve ratio significantly affect economic in Nigeria. The results also indicated that there exists positive relationship between cash reserve ratio and GDP.

Employed money supply and interest rate as monetary policy and inflation as a macroeconomic variable, Irfan and Ume-Amen (2011) examined the impact of monetary policy on Gross Domestic Product in Pakistan. The authors employ the OLS estimation technique with a time series data spanning from 1980 to 2008 and found that monetary policy has a positive effect on economic growth in Pakistan. Chimobi and Uche (2010) studied the relationship between money supply, inflation and output output in Nigeria. The results indicate that there is bidirectional causality between output and money

likewise inflation. The authors also noted that an increase in money supply increase growth of the economy.

Saibu and Nwosa (2011) investigated monetary policy as the cause of sectorial output growth in Nigeria from 1986 to 2008. The authors found that while the agricultural sector responds to changes in exchange rate, the manufacturing sector is not opened to monetary policy. The authors discovered interest rate and exchange rate largely determines the improvement in the performance of the mining sector. They discovered that the major factors that predict the behavior of the construction/building sector are total loan disbursed by bank and the variability in the exchange.

There is empirical evidence on the relationship between inflation behavior and economic growth. According to Levine and Renelt (1992), the average inflation rate per year for countries that experienced faster growth 12.34 percent, whereas countries with slower growth compared the average growth recorded 31.13 percent rate of inflation in a year. Similarly, Easterly et al. (1994) found that “fast growers” recorded inflation rate of 8.42 percent while “slow growers” recorded inflation rate of 16.51 percent per year.

Khan, & Schimmelpfennig (2006) concluded in Pakistan that there exists a negative relationship between inflation and real per capital GDP. The authors noted in the periods (between 1978-199) when the country recorded 8 percent inflation, per capital growth was 3 percent on average. This figure however declined to 1 percent in 1992-1997 when inflation rose from 8 percent to 11 percent. This study therefore concluded that “the direct inflation-growth nexus suggests a threshold in the range of 4 to 9 percent, while the

inflation-financial development nexus suggests a lower threshold of 3–6 percent. Based on this, it is further recommended that SBP adopts an inflation target of 5 percent.” Similarly, Paul and Chowdhury (1997) also concluded in Pakistan that there exist a negative relationship between inflation and economic growth.

In Sri Lanka, Amarasekara (2009) investigated the effect of monetary policy on economic growth and inflation rate using the Vector Autoregressive (VAR) analytical framework. The variables used in the study include, the money supply growth, changes (dynamics) in the exchange rate, inflation rate and economic growth. Amarasekara (2009) used quarterly, seasonally adjusted data from 1978 to 2005. The results indicated the inflation rate is not impacted by changes in the money supply. The results further showed that a contractionary shock reduced inflation rate, caused the exchange rate to appreciate and increased the interest rate.

Ahiabor (2012) studied the monetary and inflation rate in Ghana, using time series data from 1985 to 2009. Variables such as money supply, interest rate and exchange rate were used. As expected from economic theory, the author found that a positive correlation between money and inflation rate, and a negative relationship between the inflation rate and interest rate. He also found a positive relationship between the inflation rate and exchange rate.

Quartey and Afful-Mensah (2014) conducted a review of monetary and financial policies designed for the monetary and financial sectors of Ghana, using secondary data from the Ghana Statistical Service. The data run from 1997 to 2012. To ease monetary difficulties

and its associated high budget deficit, the authors stressed that monetary policy in Ghana should be followed by fiscal discipline. The authors concluded that, key monetary indicators assumed the right direction during the period under review. Nonetheless, the authors maintained that fiscal imbalances had limited the results.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The chapter discusses the methodology employed in the study. First, the chapter discusses the theoretical framework underpinning the study. This theoretical framework also serves as the foundation for the estimated empirical model. Second, the chapter espouses the model employed in the study. Last but not the least, it discusses the estimation techniques and also reasons for the variables adopted by the study. Finally, the chapter presents the sources of the data used for the empirical estimation.

3.1 Theoretical Model

To examine the effect of monetary policy on economic growth, the model employed is based on the Phillips' formula (see Ogbulu & Uruakpa, 2011). The Phillips' framework models economic growth as a function of money supply (M2) and exchange rate, of which money supply and exchange rate influence economic growth negatively. This assertion is further affirmed by (Nibeza & Tumusherure, 2015). Ahmad et al. (2016) extends this model to include the inflation rate and the interest rate. With the inclusion of inflation rate and interest rate, the economic growth model used by (Ahmad et al., 2016) is implicitly specified as:

$$\text{Economic growth} = f(\text{Money Supply, Exchange rate, Inflation rate, interest rate gross fixed capital formation, labour force participation rate}) \text{Equ 3.1}$$

3.2 Empirical Model

3.2.1 Economic growth and Monetary Policy in ECOWAS Countries

Based on (equation 3.1), equation 3.2 is estimated. Since sixteen (16) countries are involved in the study, panel data regression technique is employed to analysis the data.

The standard panel model for the study is, thus, espoused as:

$$\ln GDP_{it} = \alpha_0 + \alpha_1 \ln MS_{it} + \alpha_2 \ln IEXR_{it} + \alpha_3 \ln INF_{it} + \alpha_4 \ln IR_{it} + \alpha_5 \ln CAPFORM_{it} + \alpha_6 LFPR_{it} + \varepsilon_{it}$$

Eq. 3.2

Where:

$$\alpha_i, i = 0,1,2,3,4,5 \text{ and } 6$$

$\ln GDP$ = the logarithm transformed GDP, which measures economic growth of the countries.

$\ln EXR$ = the logarithm transformed Exchange rate

$\ln INF$ = logarithm transformed inflation rate

$\ln MS$ = logarithm transformed Money supply

$\ln IR$ = logarithm transformed Interest rate

$\ln CAPFORM$ = logarithm transformed gross fixed capital formation

$LFPR$ = labour force participation rate

ε_{it} = the stochastic error term.

The according to (Gujarati, 2009; Green, 2008), the error term in a panel regression can be broken into two as follows:

$$\varepsilon_{it} = \mu_i + \lambda_t + \nu_{it} \quad \text{Eq. 3.3}$$

Where, μ_i is the unobservable country specific effect, λ_t is the unobservable time effect, ν_{it} is a new random error term. Thus, Eq. 3.2 can then be rewritten as:

$$\ln GDP_{it} = \beta_i + \beta_1 \ln EXR_{it} + \beta_2 \ln INF_{it} + \beta_3 \ln MS_{it} + \beta_4 \ln IR_{it} + \beta_5 \ln CAPFORM_{it} + \beta_6 LFPR_{it} \nu_{it}$$

Eq. 3.4

Where β_i is a vector of overall and N – 1 country-specific intercept terms, and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the associated unknown parameters of the explanatory variables.

This panel model (i.e., Eq. 3.4) is the empirical model used in this study.

The essence of using the logarithm for of the variables is to reduce heteroscedasticity (Gujarati, 2003). This specification also gives the parameter estimates an elasticity interpretation.

3.3 Advantages of a Panel Data

Using panel data for economic analysis is associated with several advantages (Gujarati, 2009; Green, 2008). The use of panel data eliminates the problem associated with time series and cross sectional data. For instance, the use of panel data allows for more degrees of freedom because panel data is made up of time series data and cross sectional. Also, multicollinearity is reduced in a panel data because panel data set is usually having a higher number of observation hence allows more variability. Furthermore, panel data

effectively address the problem of heterogeneity in the cross sections by employing in it analysis the individual-specific.

Again, the use of panel data for analysis reduces the problem of aggregating data which is mostly linked to time series. Panel data is preferred over cross-sectional and time series data because it has the ability to detect effect that time series and cross sectional data cannot detect an also give a better measurement. Finally, unlike time series data which demands dropping of some data in time periods that have some missing observations, panel data give unbiased estimates even when there are missing observations in some cross sections. For this reason, the use of panel data is very appropriate for this study because of the problem of missing observations associated with data on variables among the ECOWAS countries.

3.4 Random Effects model and Fixed Effects

The fixed effects model or the random effects model is usually employed in a panel data analysis (Green, 2008). The intercept of the random effect model is treated as a random outcome variable which is a functional combination of a mean value and a random error. This therefore implies that, the random deviations from the constant to the cross sectional unit is measured by the error term of the cross sectional unit. Over time, the error term of the cross sectional unit is constant a random effect model. The correlation between the error term of the cross sectional unit and the errors of the explanatory variables in the random effect model should be zero. As a result of specification of the intercept in the model, random effect model makes room for time invariant explanatory variables.

The fixed effect model on the other hand has a slope is constant and is characterized by having different intercepts for each entity. The assumption behind the different intercepts in the fixed effect model is the omitted variable effect. The varying of intercepts of cross sectional unit is to absorb the effect of all omitted variables that do not vary over time but differ across entities. The fixed effect model has its advantages and disadvantages.

The fixed effect model allows for error terms which correlate with the individual specific effect. This model however has a problem of multicollinearity and loss of degrees of freedom that usually occurs when several dummy variables of many cross sectional units are used in the model. Also, this model may fail to predict better estimation for analysis because it is face with the problem of autocorrelation which is specific to a cross sectional unit.

In summary, we can say that the random effect has a country specific error term whereas the fixed effect model has a country specific intercept. This study used the Hausman test to ascertain which of these models is most appropriate to conduct the analysis.

3.5 Choice between Pooled Model and Panel Effect Models (Random Effect, Fixed Effect model)

The Breusch and Pagan Lagrangian Multiplier (B-P/LM) test for random effects is used to make a choice between the fixed effect model, the random effect model, and Pooled Model for a panel data analysis. The test is able to detect whether panel effects are embedded in the data. If panel effects (i.e. the case where there are significant differences between across units and time) are found in the data, a pooled Ordinary Least Squares

(OLS) model is inferior to the Random Effect (RE) or Fixed Effect (FE) model (Gujarati, 2009). Thus, the RE or the FE model is employed when there are significant variations in the units or time being studied.

The B-P/LM framework tests for the correlation of the residuals across entities (Green, 2008). As a results, the null hypothesis states that there “no panel effects in the data”. If the null hypothesis is rejected, researcher then employs the appropriate test mechanism to choose between the RE or FE models. The workhorse framework normally employed to conduct this test is the Hausman test.

This test detects if there exist any significant correlation between the explanatory variable and the cross sectional unit random effect. The existence of a significant correlation between the ‘*cross sectional unit random effect*’ and the ‘*explanatory variable*’ shows that the fixed effect model is superior to the random effect model. If there is a correlation, the estimations of the random effect model will be inconsistent. However, if there the correlation between the cross sectional unit random effect and the explanatory variable is zero, the random effect model is the ideal model for a consistent estimation. The null hypothesis for the test is that there exists no correlation between the cross sectional unit random effect and the explanatory variables.

3.6 Justification of variables

3.6.1 Economic growth

Economic growth is measured here as the rate of change of nominal GDP. It is the dependent variable of the study. The nominal version of GDP is adopted because, the explanatory variables in this study are in their nominal form. The variable is a continuous. As used in this studies of (Nibeza & Tumusherure, 2015; Ahmed et al., 2016), the variable is driven by money supply (M2), interest rate, inflation rate and exchange rate.

3.6.2 Money Supply

The money supply measures the amount of money in the general public. It includes money in deposits accounts and money in the hands of the general public. Broad money supply (M2) is used for the study. It is defined as narrow money plus savings deposits, time deposits, and certificates of deposits. Nibeza & Tumusherure (2015) maintains that M2 is the appropriate monetary aggregate in explaining economic growth in Sub-Saharan Africa due to the relatively undeveloped money markets of these countries. The variable is included to capture the contribution of monetary policy on economic growth of ECOWAS countries. It is expected to impact economic growth negatively.

3.6.3 Nominal Exchange rate

The exchange rate is simply the price of a foreign currency. A fall in the price of a foreign currency in relation to a domestic currency is termed as exchange rate appreciation. While a fall in the price of the domestic currency relative to a foreign

currency is termed as exchange rate depreciation. Business transactions that take place among countries is done in terms of the exchange rate, therefore a depreciating exchange rate makes foreign products unattractive in a domestic country. In economic sense, this discourages imports and promotes exports. However, if the exchange rate is appreciating, foreign goods become cheaper and therefore make importation laudable whilst exportation of domestic goods is restricted. Based on the dynamics of the exchange rate, its impact on economic growth is ambiguous.

3.6.4 Inflation rate

According Friedman (1956), “*inflation is, and everywhere a monetary phenomenon*”. However, in periods of significant inflation, economic growth is expected to fall. Due to the fact that individuals are interested in the value of the money balances in terms of the goods and services they can purchase, increase inflation leads to a proportional increase in the money demand. This affects aggregate demand and economic growth negatively.

3.6.5 Nominal Interest rate

A major contribution of (Keynes, 1936 and Baumol 1952) to the theory of aggregate demand is the inclusion of the interest rate in the national income, which works through the aggregate demand. The study uses the 91-day treasury rate as a proxy for the nominal interest. The choice of this treasury bill rate emanates from the fact that the returns on treasury bill is considered as the best proxy for alternative assets. Also, the treasury bill is a risk free asset since it is controlled by the central government. The variable is expected

to have a negative relationship with the economic growth. That is, when interest rate falls, economic growth is expected to rise and vice versa.

3.6.6 Gross Fixed Capital Formation

The stock of capital in an economy is contributes immensely to economic growth. A capital formation level that addresses depreciation issues (capital deepening) and also increases existing capital stock (capital widening) is required to grow the economy. Ceteris paribus, a larger gross fixed capital formation grows an economy faster. Gross fixed capital formation is expected to have a positive relationship with economic growth and is measures as gross fixed capital formation at constant us prices.

3.6.7 Labour Force Participation Rate

Labour force participation rate is very crucial to economic growth. Economic theory, specifically the growth theories have made it clear that active labour force is a major contributing factor to economic growth (Solow 1956). A country's labour force comprises of the section of the population 15 years and older who are active economically and supply their services in a particular period. A country with a more active labour force is likely to produce more, this higher productivity if well sustained, all things being equal will lead to economic growth. The study expects labour force participation rate will be positively related to economic growth.

Table 3.1: Expected Signs of the variables

Variable	Classification	Expected Sign
Nominal Exchange rate	Continuous	+/-
Money Supply	Continuous	-
Inflation rate	Continuous	-
Interest rate	Continuous	-
Gross fixed capital formation	Continuous	+
Labour force participation rate	Continuous	+

Source: Author's Compilation, 2019

3.7 Data Type and Source

The study will use secondary data on sixteen ECOWAS countries from 2000 to 2017. This short study period is due to lack of data for most of the countries. All the data were sourced from World Bank's World Development Indicator 2018 (WDI). The dataset is an unbalance panel because there are missing data for some variables in a time period for some of the countries.

CHAPTER FOUR

ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents and discusses the results of the study in relation to the panel estimation model specified in chapter three above. The results were estimated using STATA. The analysis of the results started with a descriptive analysis of the variables used in the study, followed by the diagnostic test and finally, a presentation and discussion of the main result of the study.

4.1 Descriptive Statistics

The statistical properties of the variables use in the model from 2000 to 2017 are discussed. The summary statistics has the standard deviation, mean, the maximum and minimum values for the sample. Table 4.1 below captures the details of the summary statistics.

Table 4.1 has a standard deviation column which captures the dispersion of the variables from their means. The presence of outliers in the data is indicated by large standard errors. The spread is determined by the difference between the maximum and minimum values of the variables. The existence of a bigger gap (difference between maximum and minimum values) indicated by a large standard deviation of that variable.

Economic growth (EGROWTH) has a minimum and maximum value of 18.09 and 27.07 respectively, with an average value of 22.19 over the period. Money supply (MSUPPLY)

averaged 26.59 for the period with a maximum value of 102.57 and a minimum value of 0.024. The average interest rate (INTRATE) for the period was about 7.09, with a minimum and maximum value of -28.52 and 30.24 respectively. Table 4.1 below captures the breakdown of the rest of the control variables.

Table 4.1: Summary Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum
EGROWTH	22.19736	1.656193	18.08703	27.06627
MSUPPLY	26.59595	17.82517	0.0241672	102.57
INTRATE	7.090094	8.255865	-28.51641	30.23685
XCHRATE	1467.194	3321.11	0.5449192	19068.42
INFLATION	6.04653	6.557892	-4.787234	34.69527
CAPFORM	20.783	1.649664	15.75775	25.06627
LFPR	65.28289	9.207139	50.062	81.928

Source: Author's Computation

Table 4.2 reveals the correlation matrix for the study. According to (Pindyck and Rubinfeld, 1991), the correlation coefficient gives an index of the direction and magnitude of the relationship between the variables. Apart from capital formation, the table shows that there exists a weak correlation between GDP and money supply, exchange rate, interest rate, inflation rate. The correlation between GDP and these variables are -0.26, -0.05, -0.35, and 0.016 respectively. This implies that there exists weak correlation between GDP and money supply, exchange rate, interest rate, inflation rate. The correlation coefficient between GDP and gross fixed capital formation, however, is strong and positive. It is estimated at 0.96.

Table 4.2: Correlation Matrix

	EGROWTH	MSUPPLY	INTRATE	XCHRATE	INFLATION	CAPFORM	LFPR
EGROWTH	1.00						
MSUPPLY	-0.26	1.00					
INTRATE	-0.35	0.18	1.00				
XCHRATE	-0.05	-0.17	-0.03	1.00			
INFLATION	0.16	-0.29	0.05	-0.03	1.00		
CAPFORM	0.96	-0.18	-0.35	-0.07	0.16	1.00	
LFPR	-0.23	0.09	-0.31	0.09	-0.35	-0.25	1.00

Source: Author's Computation

4.2 Hausman Specification Test

In order to use the appropriate model for the study, the study employed the hausman specification test to help choose between the fixed effect and random model. Table 4.3 below presents the results from the hausman specification test.

Table 4.3 Hausman Specification Test

	Coefficients			
	(b)	(B)	(b-B)	Sqrt (diag (V_b_B))
	FE	RE	Difference	Standard Errors
MSUPPLY	0.0064091	-0.0019616	0.0083707	0.0022434
INTRATE	-0.0009657	0.0006773	-0.001643	
XCHRATE	-0.000276	-0.0001923	-0.0000837	0.0001242
INFLATION	-0.009057	-0.0068904	-0.0021666	
CAPFORM	0.558759	0.7008861	-0.1421271	0.0436682
LFPR	0.0174559	0.010383	0.0071728	0.0070367

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2 (6)} = (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B})$$

$$= 19.40$$

$$\text{Prob}>\text{chi2} = 0.0035$$

(V_b-V_B is not positive definite)

Source: Author's Estimation

The results from the Hausman rejected the null hypothesis of no correlation between the regressors and the country heterogeneity error term. This makes the fixed effect model appropriate over the random effects model. The study therefore, concentrates on results of the fixed effect (FE) model.

4.3 Fixed Effect Model Results

The hausman test revealed that there are significant differences between the countries and time for the period under consideration. (see table 3). This implies that the fixed effect model is appropriate for the study.

Due to the unbalanced nature of the data, 133 observations out of 238 observations (17 years by 14 countries) were used in estimating the fixed effect model. The coefficient of determination is estimated as 0.796, which means that about 79.96 percent of the variations in economic growth is explained by exchange rate, money supply, inflation rate, interest rate, gross fixed capital formation and labour force participation rate.

The overall objective of this study was to investigate the effect of money policy on economic growth of ECOWAS countries. The findings revealed that ECOWAS countries can make use of money supply to augment economic growth to create wealth and employment for their citizenry. The results of Nibeza and Tumusherure (2015) corroborates this finding. Using the Turkish economic data, the authors found evidence of a long term relationship and a unidirectional causality between money supply and output growth. Specifically, the finding of this study indicates that a percentage change in money supply increases economic growth by 0.064 percent. In other words, a

proportionate increase in money supply increases economic growth by less than proportionate, indicating an inelastic relationship. The result is statistically significant at 5 percent.

This is also in line with predictions of economic theory (Keynes, 1931; Hicks, 1951) that increase in the money supply reduces the cost of doing business (interest rate), which motives the private sector to expand production. The terminal effect of this transmission is an increase in GDP and economic growth. However, care must be taken in the employment of money supply in monetary policy making since excessive growth of money supply has inflationary tendencies (Friedman 1956; 1988; Gul, Mughal & Rahim, 2012)

The inflation rate is statistically insignificant in driving economic growth in the ECOWAS countries. This is surprising as the findings contradict (Ogbulu & Uruakpa, 2011; Nibeza & Tumusherure, 2015). Nibeza and Tumusherure (2015), in particular, found a long term relationship between output growth and the inflation rate. But this could be due to the use of panel data in this study as opposed to time series data in (Nibeza & Tumusherure, 2015). However, the interest rate is statistically significant in driving economic growth in the ECOWAS countries. As expected, the interest rate influences economic growth negatively. A percent increase in the interest rate decreases the economic growth of these countries by 0.097 percent. Statistically, the result is significant at all levels. The results confirm the findings of (Nibeza & Tumusherure, 2015; Ahmed et al., 2016). It also confirms economic theory postulations that a rise in the interest rate decreases GDP through a decline in investments (Keynes, 1931). This

implies that a monetary policy framework that continues to hold interest up will decrease the economic growth in these countries under study.

The fixed effect model revealed that exchange rate significantly impacts economic growth in the ECOWAS countries. Specifically, a percentage increase in the exchange rate decreases economic growth by 0.03 percent. The result is statistically significant at 10 level. This could be due to the pass-through effects which reduce aggregate demand and national income. The is significantly pronounced if the countries or region involved are import dependent like the ECOWAS countries. The findings corroborates the results of (Agbonlahor, 2014; Bagheto & Stephen, 2014; Berument & Dincer, 2008; Nibeza & Tumusherure, 2015; Ahmed et al., 2016). It therefore implies that stringent exchange rate polices be advanced through the creation of effective foreign exchange rate markets in the ECOWAS countries to smoothen and stabilities the currencies of the countries under study.

Table 4.4: Fixed Effect and Random Effect Estimates

VARIABLES	Fixed Effect	Random Effect
	(1)	(2)
Dependent Variable : Economic Growth		
MSUPPLY	0.064** (0.0042)	-0.196* (0.0037)
INTRATE	-0.097*** (0.0044)	0.0677*** (0.0046)
XCHRATE	-0.028* (0.0002)	-0.0192* (0.0001)
INFLATION	-0.0091 (0.0063)	-0.0069 (0.0649)
CAPFORM	0.559*** (0.0668)	0.7009*** (0.0505)
LFPR	0.01745 (0.0117)	0.0103 (0.0093)
Constant	9.704*** (1.5068)	7.348*** (1.2575)
Observations	133	133
R-squared	0.796	
Number of country1	14	14

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation

Table 4.4 further reveals that, gross fixed capital formation positively drives economic growth in ECOWAS countries. The result shows that a percentage increase in gross fixed capital formation increase economic growth by 0.56. This result is statistically significant all levels. The finding is consistent with the results of (Ogbulu & Uruakpa, 2011). The authors found that fixed capital formation is a critical driver of economic growth in the Nigerian economy. Labour force participation however, is statistically insignificant in driving economic growth in the ECOWAS countries. This is surprising as the findings contradict the argument of the growth models (Solow, 1956).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a brief overview of the preceding chapters in this study. It also covers the summary of findings, conclusions, policy recommendations, limitations of the study and finally, suggestions for further research.

5.1 Research Summary

The effects of monetary policy on economic growth has been of interest to economists. Monetary policy has been used a key instrument in stabilizing the price level of economies. It has also been used a key strategy in expanding national incomes of countries. Economic growth can be defined as a sustained increase in the GDP over time. Growth in GDP increases employment, income and reduces poverty.

ECOWAS consist of 18 countries. These include, Ghana, Nigeria, Sierra Leon, Benin, Guinea, Guinea-Bissau, Liberia, Burkina Faso, Gambia, Ivory Coast, Togo, Niger, Cape Verde, Senegal, Sao Tome, Saint Helena, Mauritania and Mali.

West ECOWAS countries control a significant proportion of African's GDP. For instance, the first and second largest economies in the sub region are Nigeria and Ghana. However, the economic growth of the countries in this group have slow in recent years. Due to the economic size and structure of these economies, a sustained growth in their

production capacities has the potential of increasing employment, aggregate incomes, as well as reduce poverty in the sub-region.

However, little research works have been done to uncover the typical variables that influence the economic growth of these countries from the monetary policy context. The few studies conducted in this area are county specific and are thus unable to provide clear information of the monetary variables that driven growth in ECOWAS countries. This study bridges this gap of country specific based studies to pooling of the data of the ECOWAS countries and analyzing with them a fixed effect panel model.

Using, panel data on the six countries from 2000 to 2017, the study revealed that out of the six explanatory variables used in the study (inflation rate, exchange rate, money supply, interest rate, gross fixed capital formation and labour force participation rate), inflation rate and labour force participation rate are statistically insignificant. The remaining variables are statistically significant at all levels. Whilst the exchange rate and interest rate influence economic growth of the ECOWAS countries negatively, money supply and gross fixed capital formation relates to economic growth positively. Specifically, a percent increase in the exchange rate reduces economic growth by 0.03 percent. This could be due to the pass-through effects which reduce aggregate demand and national income. The findings corroborates the results of (Agbonlahor, 2014; Bagheto & Stephen, 2014; Berument & Dincer, 2008; Nibeza & Tumusherure, 2015; Ahmed et al., 2016). It therefore implies that stringent exchange rate polices be advanced through the creation of effective foreign exchange rate markets in the ECOWAS countries to smoothen and stabilities the currencies of the countries under study.

Also, a percentage increase in money supply increases economic growth by 0.06 percent. In other words, this implies that a proportionate increase in money supply increases economic growth by less than proportionate, indicating an inelastic relationship. This is in line with economic theory (Keynes, 1931; Hicks, 1951) that an increase in the money supply reduces the cost of doing business (interest rate), which motivates the private sector to expand production. The terminal effect of this transmission is an increase in GDP and economic growth. However, care must be taken in the employment of money supply in monetary policy making since excessive growth of money supply has inflationary tendencies (Friedman 1956; 1988; Gul, Mughal & Rahim, 2012)

Again, a percent increase in the interest rate decreases the economic growth of these countries by 0.097 percent. The results confirm the findings of (Nibeza & Tumushere; Ahmed et al., 2016). It also confirms economic theory postulations that a rise in the interest rate decreases GDP through a decline in investments (Keynes, 1931). This implies that a monetary policy framework that continues to hold interest up will decrease the economic growth in these countries under study.

Finally, gross fixed capital formation positively drives economic growth in ECOWAS countries. Thus, a percentage increase in gross fixed capital formation increases economic growth by 0.56.

5.2 Conclusion

Economic growth is imperative in poverty reduction and income creation. Monetary policy has been a major policy strategy used by countries in expanding national income. The study concludes that Monetary policy has a significant effect on the economic growth of ECOWAS member states. Specifically, apart from the inflation rate, money supply (M2), exchange rate, and the interest rate significantly impact economic growth of ECOWAS countries.

5.3 Policy Recommendations

Based on the foregoing, the following policy recommendations are made:

- The Central Banks of the ECOWAS countries should strengthen the monetary policy accountability and credibility to maintain a short, medium, and long-run focus on improving their Monetary Policy frameworks. This can be done by obtaining the optimal money supply that would sustain economic growth in these countries.
- The independence of the Central Banks must also be upheld at its optimal level. This would encourage the central bank to be transparent in the dealings with the general public, a phenomenon that would keep expectations at favourable levels to reinforce the effectiveness of their monetary policy frameworks.
- It is further recommended the Central Banks and Finance and Economic Planning ministries of these countries implement concrete macroeconomic

reforms to take advantage of the monetary policy to boost investments, through interest reduction.

- Finally, the study recommends that formidable exchange rate policies be undertaken to check the perennial depreciation of the currencies of ECOWAS countries. This can be done by strengthening their exports base, through the value addition of exported products.

5.3 Limitations of the Study

As with every study, this study has some limitations. The first weakness is that; the study could not make use of large data points as the annual data retrieved was small. Quarterly data would have helped the situation as large data point would have been sourced. However, quarterly data do not exist on all fourteen countries for these variables. Also, due to the small size of the data, the study could not employ sophisticated panel data models to analyze the data.

5.4 Suggestions for future research

Firstly, future studies could consider doing the analysis with sophisticated panel data models, such as Panel Vector Autoregressive Models. This would help to obtain possibly efficient parameter estimates. Secondly, future studies should make use of large data points to prevent typical econometric problems such, biasedness and inconsistent problems.

REFERENCE

- Adefeso, H. and Mobolaji, H. (2010) 'The fiscal- monetary policy and economic growth in Nigeria: further empirical evidence', *Pakistan Journal of Social Sciences*, Vol. 7(2) Pp 142
- Agbonlahor, O. (2014). The Impact of Monetary Policy on the Economy of the United Kingdom: A Vector Error Correction Model (VECM). *European Scientific Journal*, 10(16).
- Ahiabor, G. (2013). The effects of monetary policy on inflation in Ghana. *Developing Country Studies*, 3(12), 82-89.
- Ahmad, D., Afzal, M., Ghani, U. (2016). Impact of Monetary Policy on Economic Growth Empirical Evidence of Pakistan. *International Journal of Applied Economic Studies*. Vol. 4 (6).
- Anowor et al. (2016) "A reassessment of the impact of monetary policy on economic Growth: study of Nigeria". *International Journal of Developing and Emerging Economies* Vol.4, No.1,
- Barro, R. (1997). *Determinants of Economic Growth: a Cross-country Empirical Study*. Massachussets: MIT Press, Cambridge.
- Baumol, W. J. (1952). The transactions demand for cash: An inventory theoretic approach. *The Quarterly Journal of Economics*, 545-556.
- Bawumia, M. and Abradu – Otuo P., (2003), *Monetary Growth, Exchange Rates and*

inflation in Ghana: An error correction Analysis, Bank of Ghana Working paper.

WP / BOG – 2003/ 03. Pp2-1

Bernanke, B., Blinder, M., (1992) *The Inflation Targeting Debate*, University of Chicago Press

Cagan, P. (1956). *The monetary dynamics of hyperinflation. Studies in the Quantity Theory of Money. University of Chicago Press*

Christiano, L. J., Eichenbaum, C., Evans J. (1999). Taylor rules in a limited participation model. *De Economist*, 147(4), 437-460.

Dimitrijevic, B., & Lovre, I. (2001). Essay on Monetary Policy and Economic Growth. *Journal of Central Banking Theory and Practice*, 111-138.

Easterly, Williams, King, Levine, Ross, & Sergis. (1994). Policy, Technology Adoption and Growth. *National Bureau of Economic Research*, Working Paper 4651.

Fabyan, A. H.H. (2009). Foreign Direct Investment: Trends, Historical Development and Determinants in Member Countries of West Africa Monetary Zone (WAMZ). Unpublished Master of Arts Thesis. University of Ottawa.

Fosu, K. N. (2015). Inflation Targeting: The Ghanaian Experience. Unpublished Master of Philosophy Thesis. Kwame Nkrumah University of Science and Technology.

- Friedman , M., & Schwartz, A. (1963). Money and Business Cycles. *Review of Economics and Statistics*, pp. 32-64.
- Friedman, M. (1974). A Theoretical Framework for Monetary Analysis. Chicago: *University of Chicago Press*.
- Greene, W. H. (2008). *Econometric Analysis*, 6th Edition. Upper Saddle River, *New Jersey*: rentice-Hall.
- Gujarati, D. N. (2003). *Basic Econometrics*. McGraw-Hill, Inc.
- Gujarati, D. N. (2009). *Basic econometrics*. Tata McGraw-Hill Education.
- Irfan, N. & Ume, A., (2011). Impact of Monetary Policy on Gross Domestic Product. *Journal of Economics*, paper no. 35562, Volume 3, No. 1, Iqra University, Pakistan
- Keynes, J. M. (1973). 1936. The general theory of employment, interest and money, 7.
- Khan, M. M. S., & Schimmelpfennig, M. A. (2006). Inflation in Pakistan: Money or wheat? *International Monetary Fund*. No. 6-60.
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The quarterly journal of economics*, 108(3), 717-737.
- Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *The American economic review*, 942-963.

- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review*, 433-443.
- Munkherjee, S. (2007). *Analytical Macroeconomics: From Kenyes to Mankiw*. New Central Book Agency, Kolkata.
- Nibeza, S. and Tumusherure, W. (2015) “The Impact of Monetary Policy on Rwanda’s Economy: Analysis of Vector Error Correction Model (1980-2006)” *International Journal of Contemporary Applied Sciences* Vol. 2 No. 5.
- Ogbulu, O. M., Uruakpa, P. C. (2011). Monetary Policy and Stock Prices in Nigeria: A Cointegration and Error Correction Approach. *ABSU Journal of Arts, Management, Education, Law and Social Sciences (Jamelss)* Vol 1. 1, p. 67.
- Onyeiwu, C (2012) “Monetary Policy and Economics Growth in Nigeria” *Journal of Economics and Sustainable Development* Vol.3, No.7 2012.
- Oosterbaan, M., Steveninck, T., & Windt, N. (2002). *The Determinants of Economic Growth*. London: Kluwer Academic Publishers.
- Paul, S., Kearney, C., & Chowdhury, K. (1997). Inflation and economic growth: a multi-country empirical analysis. *Applied Economics*, 29(10), 1387-1401.
- Pindyck, R. S. (1991). *Econometric Models and Economic Forecasts*. N. Y. The Netherlands : McGraw-Hill.

- Quartey, P., & Afful-Mensah, G. (2014). Financial and monetary policies in Ghana: A review of recent trends. *Review of Development Finance*, 4(2), 115-125.
- Rebelo, S. (1991). Long-run Policy Analysis and Long-run Growth. *Journal of Political Economy*, Vol. 99(3), pp. 500-521.
- Rogers, M. (2003). "A Survey of Economic Growth". *Economic Record*, Vol.79(244), pp.112-135.
- Romer, P. (1986). Increasing Returns and Long-run Growth. *Journal of Political Economy*, Vol. 98(5),pp. 1002-1037.
- Saibu M.O. and Nwosa I.P (2011): Effects of Monetary Policy on Sectoral Output Growth in Nigeria (1986 to 2008); *Journal of Economics and Behavioral Studies*, Vol. 2, No. 6,
- Solow, R. (1956). A Contribution to Theory of Economic Growth. *The Quarterly Journal of Economics* , Vol. 70, pp. 65-94.
- West African Monetary Institute (2013). Fiscal and Monetary Policy Coordination in the Wamz: Implications for Member States' Performance on the Convergence Criteria