

**EFFECTS OF UNEMPLOYMENT AND INFLATION ON ECONOMIC GROWTH  
IN NIGERIA, 1986-2012.**

**BY**

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### **Declaration**

I declare that the work in this thesis entitled “Effects of unemployment and inflation on economic growth in Nigeria” has been performed by me in the Department of Economics. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other Institution.

AminuUmaru

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Signature

.....  
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### **Certification page**

This thesis entitled “EFFECTS OF UNEMPLOYMENT AND INFLATION ON ECONOMIC GROWTH IN NIGERIA” by AMINU UMARU meets the regulations governing the award of the degree of masters (MSc) in Economics of the Ahmadu Bello University, and approved for its’ contribution to knowledge and literary presentation.

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### **Abstract**

This thesis investigates the effects of unemployment and inflation on economic growth in Nigeria between 1986-2012 through the application of Ordinary Least Square (OLS) technique in estimating the effects of unemployment and inflation on growth, Augmented Dickey-Fuller test and Phillip's-Perron test statistics were employed to test the presence of unit root in the series, after which Johansen cointegration test was employed to test the existence of long-run relationship between economic growth and the independent variables. The results of unit root suggest that all the variables in the model were stationary. The Johansen cointegration result shows that there exist 2 cointegrating equations, implying the existence of long run relationship between economic growth, unemployment and inflation. The results also reveal that unemployment impacts negatively on economic growth while inflation rate impacts positively on economic growth. However,, only the coefficient of unemployment was found to be significant. The hypothesis test result using f-statistics reveals that unemployment and inflation jointly affect economic growth at 1 percent and 5 percent respectively, with values of 5.8900 in model II and 4.0637 in model III. This therefore, implies that a good performance of the Nigerian economy in terms of growth may be achieved with lows rate of unemployment and inflation in the country. Based on the coefficients of unemployment -4.6727 and inflation 0.0246 in model III, it follows that 1 percent reduction in unemployment would increase economic growth by 4.6727 percent, while 1 percent increase in inflation would increase economic growth by 0.0246 percent; hence a major policy implication is that concerted effort should be made to reduce unemployment and stabilize the prices of goods and services (inflation) so as to achieve high, rapid and sustained economic growth rate in Nigeria.

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the study**

The Nigerian economy has remained largely underdeveloped despite the huge human and natural resources. The country is richly endowed with various mineral types all over the country. Huge amount is generated annually from petroleum products. More than 40 types of solid minerals have been identified in over 500 locations in the country Musa(2010). Yet the per capita income is low, unemployment and inflation rates are high. There are many socio-economic challenges. The economy has continued to witness economic recovery which is immediately followed by economic recession and depression.

The situation in Nigeria is disturbing. The various macroeconomic policies by government have been unable to achieve sustained price stability, reduction in unemployment and sustained growth cannot be achieved. The poor state of the economy has confirmed the need to manage the economy effectively. The essence of macroeconomic management underlines the rationale for the existence of government as a vital economic agent. However, it appears that government intervention has not been able to cure the ills in the Nigerian economy.

The continued economic crisis, with the associated problems of high inflationary pressure, high exchange rate, and debt overhang, adverse balance of payment and high inflation rates is difficult to explain. Against a high rate of unemployment and underemployment, a large public sector, low wages and poor working conditions has been persistent high inflation rates in Nigeria. Also, underemployment and unemployment is a prominent feature of the Nigerian economy. Consequently, the full potentials of labour-surplus economy have not been fully exploited.

In the 1960s and early 1970s, the Nigerian economy provided jobs for most Nigerian and absorbed considerable imported labour while inflation rates were low. The wage rate

compared favourably with international standards and there was relative industrial peace in most of the years. Following the oil boom of the late 1970s, there was mass migration of people, especially the youth, to the urban areas seeking for jobs. Following the downturn in the economy in the early 1980s, the problems of unemployment and inflation increased, precipitating the introduction of the Structural Adjustment Programme (SAP). The rapid depreciation of the naira exchange rate since 1986 and the inability of most industries to obtain adequate raw materials required to sustain their output levels fuelled inflation. There was rapid depreciation of the naira which caused sharp rise in the general price level, leading to a significant decline in real wages and increased poverty. The low wages contributed to a weakening of the purchasing power of wage earners and declining aggregate demand. Consequently, industries started to accumulate unintended inventories.

## **1.2 Statement of the problem**

Economic growth in Nigeria has been poor since 1986 when SAP (Structural Adjustment Programme) was introduced. Economic growth in Nigeria was not encouraging between 1986 and 2012. The continuous economic crisis reflected in high inflationary pressure, high level of corruption, exchange rates distortions, debt overhang, high rates of unemployment to mention a few. Unemployment and inflation are two twin evils that have eaten deep into the fabric of the Nigerian economy over the years.

The trends in economic growth rates, unemployment rates and inflation rates in Nigeria from 1986-2012 have been puzzling. The data obtained from the Central Bank of Nigeria (CBN), 2013 Statistical bulletin revealed that by 1986 economic growth rate stood at 3.1 percent, in 1987 the value became negative -0.69 implying retrogression and was the least ever achieved for the period under review; the highest economic growth rates achieved was 11.36 in 1990 after which the rates has been abysmally until in 2003 when the growth rates hits 10.2 percent; from 2003 economic growth rate has been less than 10 percent, in 2012 the growth

rate recorded was 6.58. The trend in economic growth has been fluctuating over the years under review.

The trends in unemployment and inflation rates in Nigeria from 1986-2012 was also puzzling. The trend revealed that by 1986 unemployment rate was 5.3 percent while inflation rate was 5.4 percent. Both unemployment rates and inflation rates were not stable but fluctuating over time. The lowest rates of unemployment and inflation recorded were 1.8 percent and 0.2 percent in 1995 and 1990 respectively. Unemployment reaches 24.7 percent by 2012 while inflation reaches the highest in 1999.

The main goals of macroeconomic policies were the achievement of high, rapid and sustained economic growth, stable low unemployment and relative price stability but the trends above shows the contrary. Among the main and major problems of policy makers were how to achieved and maintain low and stable unemployment rate as well as relatively low prices so as to achieve high economic growth.

Studies by (Garba, 2010, and Olowononi and Audu (2012), have examined the nature and causes of unemployment in Nigeria and found disturbing trends. There are very few studies which have been undertaken regarding the effect of unemployment and inflation on economic growth in Nigeria. Some of the existing studies used basically descriptive statistics (see Olowononi and Audu (2012). Aminu and Anono, (2012), Bakare, (2012) and Rafindadi, (2012) conducted similar studies and their findings were controversial especially in the area of impact of the two twin's evils (unemployment and inflation) on the growth of the Nigerian economy. Bakare found negative relationship between unemployment, inflation and growth, Rafindadi (2012) found negative non-linear relationship between unemployment and output growth while Aminu and Anono found positive relationship between inflation and economic growth in Nigeria. Another study was also conducted in the same vein in China by Chang-Shuai Li and ZI-Juan Liu (2012) on unemployment rate, economic growth and inflation. The

results revealed that unemployment impacted negatively on growth while inflation impacted positively on growth in China. The puzzling trends of economic growth rate, unemployment rate, and inflation rates in Nigeria and the controversial results obtained in the empirical results provide the need to examine the relationship between unemployment, inflation and economic growth in Nigeria.

### **1.3 Research questions**

Arising from the research problems are the following questions:

- i. What is the relationship between economic growth, unemployment and inflation?
- ii. What are the causes, effects and trends of inflation in Nigeria?
- iii. What are the trends, structure and causes of unemployment in Nigeria?

### **1.4 Objectives of the study**

The main objective of the study is: to examine the impact of unemployment and inflation on economic growth in Nigeria.

The specific objectives of this study include the following:-

- (i) To estimate the relationship between economic growth, unemployment and inflation.
- (ii) To analyse the causes, effects and trends of inflation in Nigeria.
- (iii) To assess the trends, structure and causes of unemployment in Nigeria.

### **1.5 The Hypothesis to be tested is as follows:**

#### **Null hypothesis (H<sub>0</sub>)**

H<sub>0</sub>: Unemployment and inflation have no effect on economic growth in Nigeria.

#### **Alternative hypothesis (H<sub>1</sub>)**

H<sub>1</sub>: Unemployment and inflation have effect on economic growth in Nigeria.

## **1.6 Significance/justification of the study**

The adverse effects of unemployment and inflation on economic growth has attracted the attention of government and researchers the world over. Among the main and major problems of policy makers are how to maintain low and stable unemployment as well as relatively stable prices so as to achieve high economic growth. Several studies were conducted on the impact of unemployment and inflation on economic growth in Nigeria.

Studies studies such as (Aminu and Anono, 2012, Bakare, 2012, Rafindadi, 2012 and Aminu, Manu and Salihu 2013) used econometric models. Their findings are controversial especially in the area of impact of the two twin's evils (unemployment and inflation) on the growth of the Nigerian economy.

Aminu and Anono 2012 investigated the effect of inflation on economic growth and development in Nigeria. They employed OLS, ADF and Granger causality and found that there is a positive correlation between inflation and economic growth in Nigeria, though the results revealed that the coefficient of inflation is not statistically significant, but is consistence with the theoretical expectation, causation runs from GDP to inflation implying that inflation does not Granger cause GDP but GDP does.

Bakere (2012) conducted a study on stabilization policy, unemployment crises and economic growth in Nigeria. He used OLS and found that the nexus between inflation, unemployment and economic growth in Nigeria were negative.

Rafindadi (2012) conducted a study on the relationship between output and unemployment dynamics in Nigeria; and used OLS and Threshold model. He found a negative nonlinear relationship between output and unemployment.

Aminu, Manu and Salihu 2013 investigated the effect of unemployment and inflation on economic growth in Nigeria; they employed OLS, Augmented Dickey-Fuller technique, Granger causality and Johansen cointegration test and found positive relationship between

unemployment, inflation and economic growth in Nigeria. The weakness of the studies above apart from having controversial results also is that they failed to investigate the extent to which unemployment and inflation affects economic growth in Nigeria which this thesis is out to investigate and this justifies the study in this area. This thesis employed multi-dimensional analytical tools to investigate the relationship between unemployment, inflation and economic growth in Nigeria. This Thesis also employed double log model in estimating the elasticities coefficients of unemployment and inflation which help in solving the problem found in the previous studies reviewed. Elasticity coefficients show the extent to which unemployment and inflation affects economic growth in Nigeria form 1986-2012

The significance of this study lies on the fact that huge amount of resources (human and capital) are unemployed which could cause poor economic performance. This thesis will help policy makers to establish the extent of the effect of unemployment and inflation rates on economic growth. This thesis will improve the body of existing literature and also serve as a policy document. The problems of high level unemployment and inflation need to be addressed in order to improve economic growth.

### **1.7 Scope and limitation of the study**

The thesis covers 1986 to 2012. This period is chosen because structural adjustment programme (SAP) began in 1986. In the course of the study, the major factors that were responsible for high unemployment and inflation were investigated. The major limitations to this study were the unreliable data on unemployment and inflation rates. Therefore, the interpretation of results obtained from any computations that uses the data must be done with caution. Sometimes there are conflicting data on the same variable from different sources.

### **1.8 Organization of the studies**

This thesis is organized into five chapters. Chapter one which is the introduction started by providing a background of the subject matter, the problems and objectives follow. These are

followed by hypotheses, rationale and scope of the study as well as the organization of the chapters. Chapter two presents related literature concerning conceptual literature, theoretical, and empirical literature. Chapter three contained the research methodology, which consist of the sources of data, model specification and methods of data analysis, while the results and discussion are presented in chapter four. Chapter five contains the summary, conclusions and recommendations of the study. They are followed by references.

## **CHAPTER TWO**

### **REVIEW OF LITERATURE**

#### **2.0 Introduction**

Several attempts, especially (Stock and Watson (1999) and Williams and Adedeji (2004)) have been made to conduct systematic studies on the inflation, unemployment and economic growth. This chapter is devoted to the review of existing literature on past studies on inflation and unemployment and economic growth.

#### **2.1 Conceptual Literature**

The meaning of the basic concepts was reviewed couple with the causes, types, effects and remedies of the two phenomenons (unemployment and inflation) within and outside the Nigerian economy.

##### **a) The concept of Economic Growth**

According to Balami (2006) Economic growth which is always proxied by GDP often conceptualized as increase in output of an economy's capacity to produce goods and services needed to improve the welfare of the country's citizens. Growth is seen as a steady process which involves raising the level of output of goods and services in the economy. Growth is meaningful when the rate of growth is much higher than population growth because it has to lead to improvement in human welfare. Therefore, growth is seen as a steady process of increasing the productive capacity of the economy and hence, of increasing national income, being characterized by higher rates of increase of per capita output and total factor productivity, especially labour productivity. According to Fajingbeji and Odusola (1999) though economic growth is associated with an increase in capital per head, capital is not the only requirement for growth. Thus, if capital is made available without, at the same time, providing a framework for its use, it will be wasted. And as Hemming (1991) observed, that growth is influenced by the composition of expenditure, since certain types of spending have

more effects on growth. Essential among these types of spending are provision of socio-economic infrastructure, operations and maintenance, and general administrative and legal frameworks. Arguing in the same vein, Ogiogio (1995) emphasized that adequate funding of public sector recurrent budget makes for an effective and functional civil service, and hence, the effectiveness of implementation of development policies and programmes. As analysed by Hemming (1991), even apparently less productive expenditure, security, for example, provides social and political stability that is necessary for growth, and reducing such spending could be counter-productive. The main conclusions that can, therefore, be derived from these studies are that, public expenditure contributes to growth, and that composition rather than the level which is important.

This theses is concern with the rate of growth of the economy i.e. GDP growth rate. The rate of GDP growth can be measured by adopting the well-known compound interest formula as a framework. We can recall the compound interest formula

$$Y_t = Y_0(1 + r)^t \text{ ----- (2.1)}$$

Where  $Y_t$  is the current year output/income,  $Y_0$  is the previous year output/income;  $r$  is the compound rate of growth of  $Y$  (GDP). Assuming  $t = 1$ , equation one will be written as follows

$$Y_t = Y_0(1 + r) \text{ ----- (2.2)}$$

$$Y_t/Y_0 = 1 + r \text{ ----- (2.3)}$$

$$\text{Therefore } r = Y_t/Y_0 - 1 \text{ ----- (2.4)}$$

Equation (2.4) can therefore be used as a framework for measuring rate of growth of GDP in the country. According to Balami (2006) there are three different measurements for economic growth namely: nominal measurement of growth, real output growth rate as a measure of economic growth and growth measured in per capita values. According to Wikipedia, the free encyclopedia (2013) economic growth is measured as a percentage

change in the Gross Domestic Product (GDP) or Gross National Product (GNP). These two measures, which are calculated slightly differently, total the amounts paid for the goods and services that a country produced. As an example of measuring economic growth, a country that creates \$9,000,000,000 in goods and services in 2010 and then creates \$9,090,000,000 in 2011, has a nominal economic growth rate of 1% for 2011. Inflation or deflation can make it difficult to measure economic growth.

### **b) The concept of unemployment**

According to Balami (2006) unemployment is conceptualised as a situation where in a worker is or workers are involuntarily out of work. This means that workers are willing and able to work but cannot find any work.

Unemployment has been defined by the classical economists as the excess supply of labour over the demand for labour which is caused by adjustment in real wage. The Classical or real-wage unemployment occurs when real wages for jobs are set above the market-clearing level, causing the number of job-seekers to exceed the number of vacancies.

Unemployment was defined by the International Labour Organization (2009) as a state of joblessness which occurs when people are without jobs and they have actively sought work within the past four weeks. The unemployment rate is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by the number of individuals currently in the labour force. In a 2011, Business Week Reported, "More than two hundred million (200) people globally are out of work, a record high, as almost two-thirds of advanced economies and half of developing economies are experiencing a slowdown in employment growth.

Jhingan (2001) unemployment can be conceived as the number of people who are unemployed in an economy, often given as a percentage of the labour force.

Unemployment was also defined as numbers of people who are willing and able to work as well make themselves available for work at the prevailing wage but no work for them.

According to Aminu and Anono (2012) Unemployment can be conceptualized as total number of people who are willing and able to work, and make themselves available for job at the prevailing wage but no work for them. This therefore, implies that unemployment is a state of joblessness in the country. Unemployment can be measured using this formula

Unemployment = number of unemployed people/labour force X 100 (UR = UN/L X 100)

Labour force = No. of employed + No. of unemployed (L = EM + UN).

### **c) The concept of inflation**

According to Balami (2006), inflation is a situation of a rising general price level of broad spectrum of goods and services over a long period of time. It is measured as the rate of increase in the general price level over a specific period of time. To the neo-classical and their followers at the University of Chicago, inflation is fundamentally a monetary phenomenon. In the words of Friedman, “inflation is always and everywhere a monetary phenomenon and can be produced only by a more rapid increase in the quantity of money than output.” According Hicks, “inflation is a continuous rise in general price level.” Dernberg and McDougall (1976) are more explicit when they wrote that “the term inflation usually refers to a continuing rise in prices as measured by an index such as the consumer price index (CPI) or by implicit price deflator for gross national product.” Keynes and his followers emphasise the increase in aggregate demand as the source of demand-pull inflation. Inflation can be conceptualized as persistence raise in the general price level of broad spectrum of goods and services over a long period as a result of cost-push. To the monetarists inflation is defined as too much money chasing too few goods. Inflation can be measured using the CPI formula below

$$\text{CPI} = \frac{P_{t+1} - P_t}{P_t} \times 100 \text{ ----- (2.5)}$$

Where  $P_{t+1}$  is current year price,  $P_t$  previous year price or base year price.

In Nigeria, inflation is derived from the consumer price index (CPI). The national Bureau of Statistics (NBS), formerly known as the Federal Office of Statistics (FOS), is responsible for the computation of this index and reports it in its monthly publication, the 'Statistical News'. Officially, the CPI is called the 'Composite Consumer Price Index' since it combines the rural and urban CPIs. The percentage contribution of items in the CPI basket of goods are thus:- Core (All items less farm produce) 40.95%, Core (All items less farm produce and energy) 33.59%, Food 63.76%, Food and Non-alcoholic Beverages 64.41%, Alcoholic Beverages, Tobacco and Kola 2.06%, Clothing and Footwear 3.21%, Housing Water, Electricity, Gas and other Fuel 18.10%, Furnishing and Household equipment maintenance 3.82%, Health 1.36%, Transport and Communication 4.35%, Recreation and culture 0.89%, Education 0.21%, Restaurant and Hotels 1.29%, and miscellaneous goods and services 0.30%. (Source: CBN Occasional paper No. 32, 2007).

#### **d) The concept of Money supply**

According Layi (1999) money supply means the amount of money which is available in an economy in sufficiently liquid and spendable form. What constitute the components of this money supply depends on what has been officially accepted by monetary authorities of each country as the constituents of money supply for that country. Thus, each country's money supply definition may be unique. According to him the narrowest definition of money supply in modern time is currency plus demand deposit and this definition is known theoretically as  $M_1$ .

$$M_1 = C + DD$$

Where C is currency held by the public and not in commercial or merchant banks or currency in circulation less notes and coins in the vault of commercial and merchant banks and DD is

demand deposit or current account deposit of the banking system net of federal government demand deposit. According to Layi (1999) economist have argued that there are more financial assets that perform the functions of money or that are sufficiently liquid to be accommodated within the definition of a country's money supply. To him one of these assets is Time deposit. Although they are for specific terms or may be subject to notice on withdrawal, they are not, in practical terms, difficult to convert into cash and this leads to  $M_2$  that is a wider definition of money and the components of which are:

$$M_2 = C + DD + TD$$

$$\text{Or } M_2 = M_1 + TD \text{ (since } M_1 = C + DD \text{)}$$

According to Layi (1999) C and DD as definition of money while TD = Time deposit in local currency. A much wider definition of money is the inclusion of savings deposit of commercial banks, mortgage banks, investment and property Development Corporation etc. which is known as  $M_3$  and made up of:

$M_3 = C + DD + TD + SD$ . Where SD = Savings deposit. This study adopted  $M_2$  definition of money supply and used it for its analysis.

Theoretically relationship between money supply and growth of output proxied by GDP or GNP was discussed by the equation of exchange as follows:-  $MV = PQ$ . From the exchange equation above, we would notice that PQ equals total expenditure and equals the GNP using expenditure approach to national income estimation (Layi, 1999). The equation could therefore, be re-written as follows:  $MV = PQ = \text{GNP}$ . According to him doubling money supply will simultaneously double the level of GNP. This implies that money supply and economic growth relate positively. That is, as money supply increases, the growth of the economy increases. This study adopted this theoretical assertion.

In modern theory the general price level is determined by the forces of aggregate demand and aggregate supply. It tends to be greater than aggregate price level will move up and visa-versa. The theory may be stated using the equation of exchange:

$$MV = PQ, M = PQ/V, P = MV/Q, Q = MV/P, V = PQ/M$$

Where

M = money supply, V = velocity of money, P = price level and Q = physical volume of goods and services.

At full employment equilibrium, increase in money supply will lead to increase level of output and this will increase employment.

Keynesian and Keynes criticized the quantity theory of money in the following way:

- i. Velocity of circulation is not constant because, it is influenced by price expectations. Expected higher price will increase velocity and lower price will reduce velocity
- ii. To them prices are not flexible (upward or downward) but always upwards.
- iii. When money supply changes the first noticeable things is changes in the interest rate, not change demand for goods and services. Excess demand is converted into demand for bonds and securities not for goods and services by household.
- iv. Transaction is not constant because of existence of business cycles in the economy
- v. People have more than one motive for holding money

#### **e) The concept of interest rate**

According to Jhingan (2001) in common language interest is a payment made by borrower to the lender for the use of money and is expressed as a rate percent per year. To him, in economics, interest is defined differently by different economists. To Carver, 'interest is the income which goes to the owner of capital'. To Marshall "interest is the price paid for the use of capital in any market". To Wicksell "interest is a payment by the borrower of capital by virtue of its productivity, as reward for his (the capitalists) abstinence.

According to Jhingan (2001) interest rate play the following role in any economy:

- i. Interest induces people to save from their incomes and provides capital for productive uses.
- ii. It measures the opportunity cost of various productive channels and thus helps allocation of saving among them.
- iii. It regulates the flow of investible funds and thereby influences the growth and direction of business and industrial activity
- iv. It has been widely recognized as a powerful weapon to be used by the monetary authorities to control inflation, deflation, capital movement etc.

## **2.2 Overview of unemployment, inflation and Economic growth in Nigeria 1986-2012**

The unemployment, inflation and economic growth in Nigeria had been unstable for the period under review. The highest growth rate of GDP was recorded in 1990 follow by 2003 with the growth rate of 11.6 percent and 10.2percent respectively; while the least rate was recorded in 1987 with the growth rate of -0.69percent, which shows negative growth rate of GDP in Nigeria. The growth rate of the GDP was positive from 1986, negative in 1987, positive again from 1988-2012.

Unemployment has been fluctuating over the years. The highest unemployment rate recorded in Nigeria during the period under review was 24.7percent in 2012, and the least value of unemployment recorded was 1.8percent in 1995. Inflation rate in Nigeria also exhibit a volatile trend. The highest inflation rate recorded in Nigeria was 76.8percent in 1994 and the least value of inflation recorded is 0.2percent in 1999. Over the years government have been agitating for single digit inflation, but only 1987, 1990,1999,2006 and 2007 were found to be one digit inflation in Nigeria i.e. less than 10percent. For the remaining years under review inflation was found to be more than one digit. According to Emeka (2013) Nigeria's economy is churning along after the problems of liquidity and banking sector meltdown that

nearly crushed the financial market. The economy is progressively in recovery and it looks like the confidence of Nigerian consumer is gradually rebounding. But we cannot say for sure the exact figure because quantification of confidence has not been documented nor recorded. According to him, all the economic indicators are pointing in affirmative and right direction, therefore the economy can be say to be relatively healthy, the key economic indicators including the inflation rate is at 11% in the month of May. The increasing inflationary pressure which subsided from 12.5% to 11% year-one-year is a good response and these recent indices were documented by Nigeria's National Bureau of Statistics (NBS). The food price inflation also came down in the second quarter from 14.3% into 12.3, a sign that the gripping hands of inflation around the economy is waning.

According to him, without doubt the monetary policy coming from Sanusi's Central Bank of Nigeria (CBN) has a positive outlook on the economy which has been growing at the rate 7.3% and attracting investments mostly in petroleum sector. The revised estimate for real Gross Domestic Product (GDP) by the National Bureau of Statistics (NBS) indicates that the economy grew by 7.23percent first quarter of 2010 as against 6.7percent it had earlier projected for the quarter; at the end of 2010 the economy was growing at the rate of 7.6percent. This is impressive compares to the world economy that has been expected to be growing at the rate 3.9% in 2010 as result of the global recession.

Nigerian economy dip from 7.44 percent recorded in the fourth quarter of 2009 however, it is an increase from 4.50 percent in the corresponding quarter of last year. NBS attributes the 2.73 percentage point increase in real GDP to expansion in oil production following relative peace in the Niger Delta region, although the non-oil sector remained key driver of growth. The Bureau in the latest report on GDP estimates that the economy on nominal basis expanded to N6,399,716.09 first quarter of 2010 up from N5,004,850.00 recorded during the corresponding quarter 2009, indicating an increase of N994, 866.09. Nigerian government

can greatly strengthen the impressive growth by provision of social infrastructures particularly social security and steady electric power.

The economy growing at 7.3% in the second quarter of the year is beyond the projected expectation from the Nigerian reserve bank and economic forecasters. The experts did not anticipate the economy to be growing at a pace with the lingering effects of the credit crunch and failed banks. Sanusi's central bank of Nigeria (CBN) easing of the credit crunch by lowering the interest rate benchmark was a pragmatic move that ameliorated the dryness of the credits, together with recapitalization of financial market with over \$3.9 billion that refurbished the failed banks. The confidence generated by the CBN policy was apparent for it strengthened the confidence of the lenders and borrowers in the financial market. The infusion of fund and lower interest rate were impressive which brought about the stimulating of the economy and became the turning point for the economy.

CBN was not worried about the danger of over liquefying the capital market with cheap money and by the lowering of the interest rate bench mark which could trigger higher inflation. Executive Governor LamidoSanusi of Central Bank of Nigeria was reported saying that he can live with slightly increased inflation than with a depressed market. But in such a scenario the watchdogs at the CBN must be in constant watch of the economy to make sure that inflation will not get out of control. They can control the situation by tinkering with monetary policy and control of cheap money. Even the executive arm of the government might intervene with a well thought fiscal policy in order to cool the economy in case of escalating inflationary trends.

The structural imbalance of Nigerian economy is still a major concern. Nigeria's economy is wholly one commodity based economy which is based on the export of crude oil. The lack of diversification of the economy hampers the flourishing of domestic economy, together with enhance specialization can transformed an economy to arrays of commodities exporting

economy other than oil. The export of crude oil provides foreign reserve that has become a war chest in the maintenance of fairly and relatively strong naira. With diversified economy the problem of unemployment in Nigeria can be ameliorated. The greatest threat to Nigeria standard of living other than inflation is unemployment; even with progressively growing economy at the rate of 7.3% the economy is not producing enough jobs to make a reasonable impact on employment. The finance Minister Olusegun Aganga stated that unemployment in Nigeria was about 19.7% but financial and economic experts at Afripol Organization quantified that the real unemployment figure might be higher when rural and urban joblessness among the Nigerian youths are factored into equation. The collecting of data on employment will be probably cumbersome, if not difficult in rural areas where modern technology is rare and out of reach. Emeka (2013)

### **2.3 Causes of unemployment and inflation in Nigeria**

#### **a. Causes of Unemployment**

The yearbook of labour statistics (1984, 1985, 1986) reports that unemployment rate was generally rising due to the worldwide recession of the 1980s and 1990s. Fajana (1987) argued that the presence of expatriates in Nigerian labour market did not cause unemployment, adding that the specific causes of unemployment in Nigeria were: - techniques of production used which was capital intensive, automation, rising cost of labour, poor and inadequate planning, high growth of the population, immobility of labour, rural urban migration, monoculture nature of the economy which led to the neglect of agriculture, low labour productivity and mergers of industries.

Garba (2010) argues that the increasing rate of unemployment and graduate unemployment in Nigeria was as a result of the lack of collaboration between the entrepreneurs and the institutions (universities, polytechnic and any other academic institution's community). He maintained that the lack of this kind of synergy showed the

weaknesses, inadequacies and fallacies of the educational policies in Nigeria in attainment of its educational objectives. Dabalen et al (2000) also stressed that there was a serious disconnect between university training and the needs of the labour market arguing that the mismatch has been and continues to be socially costly to Nigeria without any mechanisms in place to address it.

Akintoye (2008) attributes the high rate of unemployment observed in 1980 to the depression in the Nigerian economy during the late 1970s. He explained that the economic downturn led to the implementation of stabilization measures which included restriction on exports, which caused import dependency of most Nigerian manufacturing enterprises, which in turn resulted in many companies operating below their installed capacity and the collapse of many industries which made workers become jobless.

Emunemu (2008) traces unemployment in Nigeria to the privatization processes and the poor performance of the public sector due to the fact that employment in the country had been public sector driven. He also noted that there was the problem of mismatch between the skills with which students graduate from tertiary institutions and those required for the healthy development of the economy. Dabalen, et al. (2000) also notes that there was rising share of graduate employment in the private sector as well as in the public sector which is traditionally a strong employer of graduates.

Okojie (2003) opines that demand for labour had been low and was declining, resulting in high levels of unemployment in most African countries due to stagnant economies and low economic growth rates in these countries. He further attributed the rising urban unemployment rate in African countries to the high degree of geographical mobility of youth in the form of rapid rural-urban migration, early marriage among young women leaving them to end up with less education and fewer skills thus increasing discrimination against them in the labour market.

Todaro (1992) was of the opinion that the high rate of urban unemployment was as a result of continuous transfer of economic activities and youths from rural to urban areas. He observed that Nigeria was plagued by a unique combination of massive rural to urban population movement, stagnating agricultural productivities and growing urban youth unemployment. This is as a result of unbalanced development.

One of the causes of unemployment according to Fadayomi (1992) was the inability to develop and utilize the nation's manpower resources effectively, especially in the rural sector. This, resulted in a high rate of urbanisation and an increasing number of youths migrating to urban areas seeking to participate in the booming commercial and other activities, thereby leaving agriculture to the aged (Usono, 1997).

Akomolafe and Adegun (2009) attributes the increasing rate of graduate unemployment to the downturn in the economy, closure of many companies and parastatals and the great down-turn in the provision of services being witnessed in the banking sector, which had always been absorbing many Nigerian graduates. Dabalén, et al. (2000) argued that the employment prospects of recent Nigeria graduates had deteriorated and attributed the poor employment conditions to the weak performance of the Nigerian economy.

Kakwagh and Ikwuba (2010) attributes the causes of youth unemployment in Nigeria to several factors, which include: increasing population growth which outstripped the supply of jobs; massive rural-urban migration by the young people to scabble for limited job opportunities; lack of employable and entrepreneurship skills by Nigeria graduates due to inappropriate school curricula.

Ajao (2004) opines that the neglect of technical and vocational education may have contributed to the high unemployment and rising poverty among the youth because many of them lack the basic job skills. He argues that they are struggling with the challenge of

acquiring “employability” skills because the society is focused mostly on formal university education. He argues that investment in skill training and trade schools is a worthwhile social investment. The graduates would become small business owners and employer of labour; this is the case in many societies where small businesses are the highest employers of labour. He advised that high school students in Nigeria should be made to gain knowledge of workplace culture and values along with general education competency. This would provide them a variety of skills to manage small-scale businesses and to gain employment after graduation, he noted.

Dauda (2010) argues that the Nigerian educational system tended to produce more of those who lack job skills for employment than the economy requires remaining vibrant due to the fact that the educational system is accompanied by structural defects, inefficiency and ineffectiveness which today place the country at its lowest ebb in human capital development and utilization. She lamented that the result of this inadequate educational system include decreasing industrial capacity utilization, rising unemployment, rising poverty, threats by social insecurity by ebullient jobless youths, and structural imbalance and system configuration.

Akomolafe and Adegun (2009) notes that the growing rate of unemployment was due to the fact that the Nigerian education system was expanding much faster than the economy, which has resulted in many graduates, who did not have marketable skills, not being able to be employed.

### **b. Causes of Inflation**

According to the classical and neoclassical economists, inflation is caused by increase in the volume or quantity of money in circulation assuming that velocity of circulation and output level is constant and given the equation of exchange  $MV=PQ$ . To the Keynesians inflation is caused by persistent increase in the demand for goods and service assuming that

velocity of circulation and output level is not constant and that when quantity of money increases the first noticeable thing is increase in interest rate and not increase in price level. The monetarist position is in sharp contrast to the structuralist school, which sees financial factors as forces propagating inflation rather than causing it. According to structuralist school inflation can result from a number of special problems in developing countries, and not just from excessive money growth. Their explanations of inflation usually centres around “structural” problems such as supply bottlenecks or high dependency on imported intermediate goods. Inflation could also arise from the cost side. Costs could change through a supply shock, an increase in local earning power arising from a boom in export earnings, (for instance, Nigeria oil boom), or devaluation. Any of these could result in a push for higher nominal wages, which drive up production costs and increases final goods prices (Layi, 1999).

In a study of OECD countries, Maynard and van Ryckeghem (1975) found that the long-run trend of rising price levels can be attributed to differences in the rates of growth and productivity in the industrial and service sectors. Other causes of rising prices are differences in the prices and elasticities between the two sectors, a uniform growth in nominal wages in both sectors, and price and wage rigidities.

The result of these problems is cost-push inflation. Post-Keynesian perspectives on the causes of inflation take a conflict theory approach, which is generally consistent with a structuralist framework. The conflict theory regards inflation as an outcome of struggles by economic groups over income shares according to Rowthorn, (1977), Rosenberg and Weisskopf, (1981). They assumed that capitalists and workers each have target real incomes, which may or may not be consistent with each other. If total claims for real income by all groups are not greater than the actual real output produced, then price stability is possible. But if total claims exceed real output available, then inflation arises. The main cause of

inflation is then the rate at which the money wage rises in excess of the growth of average labour productivity.

For both structuralists and post-Keynesians, an endogenous money supply is assumed. However, while the monetarists believe that excess aggregate demand caused by excess supply of money causes inflation, the structuralists hold that the inflation rate can increase regardless of aggregate demand, making stagflation possible. Inflation also occurs because of cost-push factors. Since the increase in money supply follows a prior price increase, structuralists believe in the endogeneity of money. According Layi (1999) and Aminu and Anono (2012) the causes of inflation in Nigeria are: the degree of openness of the Nigerian economy which may lead to the importation of inflated goods and services into the country (inflation is therefore determined also by forces outside the country (imported inflation), announcement of salary increment, such as the recent eighteen naira minimum wage increase, shortage of supply of goods and services, excess demand for goods and services, high price elasticity of demand for foreign made goods and services, high cost of production, for instance the recent removal of subsidy by federal government of Nigeria fuel inflation though it lasted just for short period.

Buhari (1987) opines that inflationary pressure in Nigeria since independence, could be traced to a number of factors such as the neglect of agricultural sector, civil war the country was involved between 1967-1970 which increased government expenditure especially in the area of weapon, massive wage increases granted to the Nigerian workers as a result the Udoji recommendations, the oil boom of the seventies increased the revenues at the disposal of the Nigerian government.

In a study by Moser (1995) he identifies the main determinants of inflation in Nigeria. He presented both a long run model and a dynamic error correction model. All the coefficient estimates had their expected signs. The monetary effect was quite large and

significant at the one percent level, while real income and the exchange rate were also significant at that level. Rainfall, on the other hand, had no significance in the long run.

In another study of inflation in Nigeria, Fakiyesi (1996) argues that inflation is dependent on growth in broad money, the rate of exchange of the naira visa-vis the dollar, the growth of real income, the level of rainfall, and the level of anticipated inflation which is based on the previous year's level of inflation he gave a functional form that assumes that the lagged value of broad money and prices were the relevant series for consideration. The lagged value of prices and money were estimated.

According to Batini (2004), the implementation of monetary policy in Nigeria has been complicated by a number of factors, including fiscal largesse, lack of operational autonomy of the central bank, insufficient and low-quality statistics, a weak transmission mechanism, and a weak financial system. His analysis revealed that neither the stable prices/free float nor the fixed exchange rate solutions were particularly appealing for Nigeria in the long run. He argued that inflation targeting with a free float still seemed to be a superior option for various reasons.

Adamson (2000) was of the opinion that the high rate of inflation, which Nigeria has been experiencing since the 1970's, has its origin in the economic measures and controls that were first put in place during the Nigerian Civil War of 1967-1970. He explained that such economic measures and control related, among others, to the fixing of prices for certain consumer goods, the determination of the volume of imports and its distribution among consumer and capital goods, the direct participation in the production and the marketing of goods, the determination of the share of wages in income and the control of profit; and the stricter control of foreign investment within the Nigerian economy. He stressed that reckless increases in the supply of money without due regard for the absorptive capacity of the

economy would always lead to inflation. Balami (2006) opines that inflation was caused by decline in productivity in an economy, application of outdated techniques, and poor harvest.

## **2.4 Strategies and policy frameworks for unemployment and inflation reduction in Nigeria**

### **a) Unemployment Reduction Strategies**

According to Aminu, et al. (2013) Government in Nigeria over the years has been pursuing various policies aiming at reducing unemployment and achieving price stability but these two twin evils keep on increasing day by day. Government and private groups tried over many years to create employment opportunities for the teeming youths. The National Directorate of Employment and school to land Skill Acquisition programmes have youth employment as the primary goal. The National Employment Policy, approved in 2002, aimed at achieving full youth employment and encouraging more private job creation. The policy emphasized linking education to the needs of the labour market. Entrepreneurship was compulsory on the curriculum of all Nigerian Universities. But youth unemployment continues to rise. There remains a skills-mismatch for the labour market, including for university and college graduates. The Central Bank started Entrepreneurship Development Centres (EDCs) in the country's six main geographical zones. There is entrepreneurship training for unemployed university, polytechnics, college and secondary school leavers. By January 2011, EDCs had trained and counselled over 34,000 graduates, created about 2,800 jobs and enabled about 1,000 graduates to access N171million for their activities.

President Jonathan introduced the 'Youth Enterprise with Innovation in Nigeria' (YouWin) programme in 2010 aiming to encourage and support youth business ideas. The Nigerian Youth Entrepreneurship Development Programme, launched by the ministry of Youth Development, also seeks to enhance skills and experience and provide access to finance for

youth entrepreneurs. The programme is expected to benefit 10,000 people aged between 18 and 35.

According to Wikipedia, the free encyclopaedia (2013), Oil companies have also helped employment efforts. In 2004, Shell Petroleum Development Company (SPDC) launched a youth development programme to provide skills for self-employment. It trained more than 1,900 people in entrepreneurship, leadership development, conflict management and industrial vocational skills. Nigerian Liquefied Natural Gas (NLNG) launched the Youth Empowerment Scheme (NLNG YES) in 2004 targeted at youths from over 100 rural communities. By 2011, more than 660 people had been trained. Several agencies and schemes were established to tackle poverty and unemployment, including the National Poverty Eradication programme, the small and Medium Enterprises Development Agency and Microcredit and Entrepreneurship Development schemes. In some local government in the country especially Lau LGA Palliative staffs were also employed to reduce unemployment in the country.

#### **b) Inflation Reduction Strategies**

According to CBN communiqué No. 78 (2011), by 1993, it was clear that the macroeconomic policies pursued were no longer sustainable and needed drastic change. In response to the ensuing macroeconomic instability, government reverted to a guided de-regulation in 1994. Interest rate again was administratively fixed. The exchange rate regime was changed and the autonomous foreign exchange market (AFEM) was introduced in 1995, while fiscal measures were introduced to curtail deficits. However, because these measures were taken at a time when there were excess money supply, scarce foreign exchange, severe shortages in commodity supply, as well as continual labour and political unrest following annulment of the June elections of 1993, there was remarkable rise in the rate of inflation. However, government has mounted an elaborate food programme that would promote food crop

production and export as well as pay more attention to the development of small and medium scale enterprises to promote wealth creation and increase output. The exchange rate has also been relatively stable, with significant real appreciation. In response to the global economic crises, the Central Bank of Nigeria (CBN) pursued measures in 2009 and 2010 to promote growth and financial stability. However, in 2011, the central bank tightened monetary policy to mop-up excess liquidity in the banking system and ward off inflationary pressures stemming from high fiscal spending, the implementation of a new minimum wage, and injection of funds into the bank system through the purchase of non-performing loans through bonds issued by asset management corporation of Nigeria (AMCON). The monetary policy rate, which was 6.25 percent in September 2010, increased six times in 2011, to reach 12 percent in December, 2011. Similarly, the cash reserve ratio was increased steadily from 1 percent in March to 8 percent in December 2011. With these measures, also inflation fell from 13.7 percent in 2010 to 10.2 percent at the end of 2011 and is expected to decline to 10.1 percent in 2012 and 8.4 percent in 2013 due to the central bank monetary policy tightening and easing food prices. (see, CBN communiqué No. 78 (2011)). With these developments, inflation inertia has been curtailed and high inflation may be a thing of the past, if sustained. Another strategies put in place to stabilize the economy was privatization and commercialization of public enterprises.

## **2.5 Theoretical Literature**

### **2.5.1 Theories of unemployment**

According to Jhingan (2001) Economists distinguish between various types of and theories of unemployment; they include cyclical or Keynesian unemployment, frictional unemployment, structural unemployment and classical unemployment. Some additional types of unemployment that are occasionally mentioned are seasonal unemployment, hardcore unemployment, and hidden unemployment; The U.S. Bureau for Labour Statistics measures

six types of unemployment. Though there were several definitions of voluntary and involuntary unemployment in the economics literature. According to Todaro (1992) Voluntary unemployment was attributed to the individual's decisions. Involuntary unemployment exists because of the socio-economic environment (including the market structure, government intervention, and the level of aggregate demand) in which individuals operate. In these terms, most of frictional unemployment is voluntary, since it reflects individual search behaviour. Voluntary unemployment includes workers who reject low wage jobs which is common in Nigeria whereas involuntary unemployment includes workers fired due to an economic crisis, industrial decline, company bankruptcy, or organizational restructuring. On the other hand, cyclical, structural and classical unemployment are largely involuntary in nature. However, the existence of structural unemployment may reflect choices made by the unemployed in the past, while classical (natural) unemployment may result from the legislative and economic choices made by labour unions or political parties.

According to Jhingan (2001) Frictional unemployment is the time period between jobs when a worker is searching for or transitioning from one job to another. It is sometimes called search unemployment and can be voluntary based on the circumstances of the unemployed individual. Frictional unemployment is always present in an economy, so the level of involuntary unemployment is properly the unemployment rate minus the rate of frictional unemployment, which means that increases or decreases in unemployment are normally under-represented in the simple statistics.

According to Adebayo (1992) Cyclical or Keynesian unemployment, also known as deficient-demand unemployment, occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work.

Structural unemployment occurs when a labour market is unable to provide jobs for everyone who wants one because there is a mismatch between the skills of the unemployed workers

and the skills needed for the available jobs. Structural unemployment is hard to separate empirically from frictional unemployment, except to say that it lasts longer.

Technological unemployment is due to the replacement of workers by machines, might be counted as structural. Alternatively, technological unemployment might refer to the way in which steady increases in labour productivity mean that fewer workers are needed to produce the same level of output every year.

He said that hidden or covered unemployment is the unemployment of potential workers that is not reflected in official unemployment statistics, due to the way the statistics are collected.

In many countries only those who have no work but are actively looking for work (and qualifying for social security benefits) are counted as unemployed.

### **2.5.2 Theories of inflation**

The most common theories of inflation according to Balami (2006) are cost-push inflation and demand-pull inflation.

#### **a) Cost-push inflation**

According to Balami (2006) is a kind of inflation which is caused by a decline in the total output of a given economy as a result of persistent increase in the cost of production. This form of inflation is sometimes regarded as the supply side inflation.

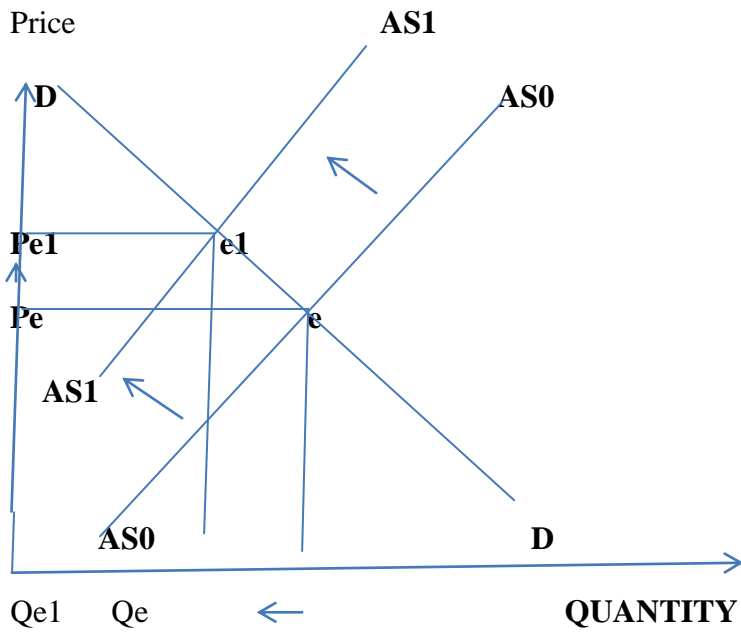


Figure 2.5.2a: Cost Push Inflation

**b) Demand-pull Inflation**

This is a kind of inflation which is as a result of a persistent increase in demand for goods and services. Aggregate demand is the summation of the demand for goods and services. If the demand for goods rises, it results in what is referred to as Demand-pull inflation according to Balami (2006). This is illustrated

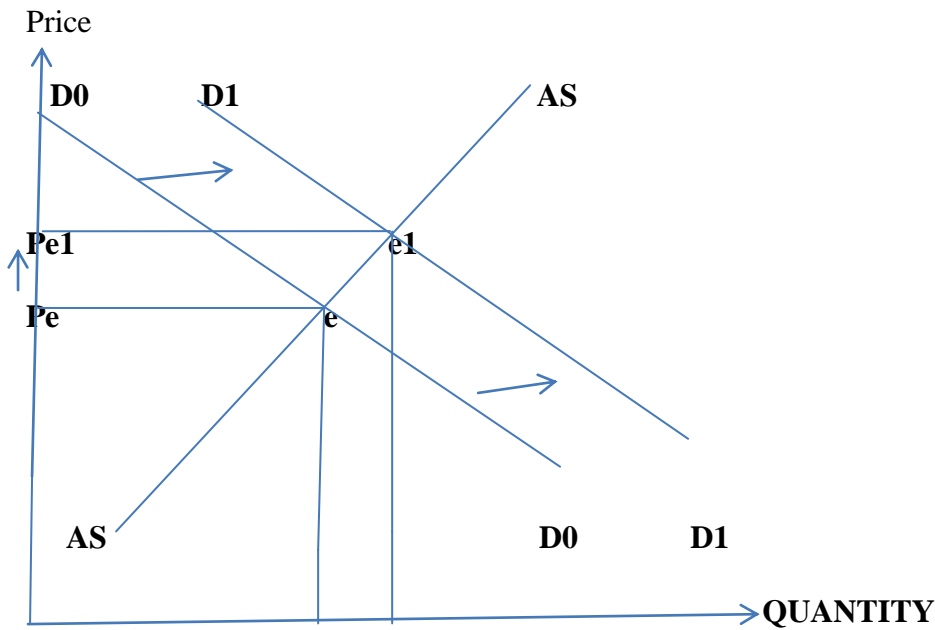


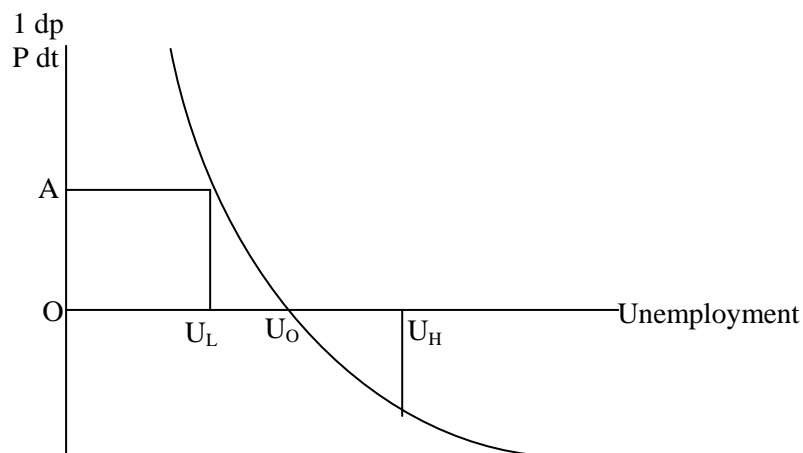
Figure 2.5.2 b: Demand-pull Inflation

**c) unemployment-inflation trade-off (Phillips curve)**

Here some of the theories of the relationship between unemployment and inflation were reviewed. The Milton Friedman Nobel memorial lecture (1976), the Phillips curve is categorized into four theories namely: the negative, the natural hypotheses, and the positive hypotheses. Keynes is left with the explanation of the Phillips curve and postulated a shift in Phillips curve.

Professional analysis of the relation between inflation and unemployment has gone through two stages since the end of World War II and is now entering a third. The first stage was the acceptance of Philips hypothesis.

Rate of price change



**Figure. 2.5.2c: Simple Philips Curve**

Philips argued that there was a stable negative relation between the level of unemployment and the rate of change of wages. High levels of unemployment being accompanied by falling wages, while low levels of unemployment by rising wages. The wage change in turn was linked to price change by allowing for the secular increase in productivity and treating the excess of price over wage cost as given by a roughly constant mark-up factor.

Fig. 2.5.2c illustrates this hypothesis which Friedman followed the standard practice of relating unemployment directly to price change, short-circuiting the intermediate step through wages.

This relation was widely interpreted as a causal relation that offered a stable trade-off to policy makers. They could choose a low unemployment target; such as  $U_L$  at the cost of inflation. In that case they would have to accept an inflation rate of A. There would remain the problem of choosing the measure (monetary fiscal, perhaps other) that would produce the level of aggregate nominal demand required to achieve  $U_L$ , but if that were done, there need be no concern about maintaining that combination of unemployment and inflation. Alternatively, the policy makers could choose a low inflation rate or even deflation as their target. In that case they would have to reconcile themselves to higher unemployment  $U_O$ , for zero inflation,  $U_H$ , for deflation Friedman (1976). Economics then busied themselves with trying to extract the relation depicted in Fig. 2.4.1 from evidence for different countries and periods, to eliminate the effect of extraneous disturbances, to clarify the relation between wage change and price change, and so on. In addition, they explored social gains and losses from inflation on the other, in order to facilitate the choice of the “right” trade-off.

Unfortunately for this hypothesis, in Nigeria evidence failed to support it.

Empirical estimates of the Philips curve relation were unsatisfactory. More important, the inflation rate that appeared to be consistent with a specified level of unemployment did not remain fixed: among countries. Looked at the other way, high rates of inflation that had earlier been associated with low levels of unemployment later change to high levels of unemployment. The phenomenon of simultaneous high inflation and high unemployment increasingly forced itself on public and professional notice, receiving the unlovely label of “stagflation”. Researchers are skeptical about

the validity of a stable Philips curve. What mattered for employment was not wages in dollars or Naira but real wages- what the nominal wages would buy in the market.

Low unemployment would, indeed mean pressure for a higher real wage-but real wages could be higher even if nominal wages were lower, provided that prices were still lower. Similarly, high unemployment would, indeed, mean pressure for a lower real wages could be lower, even if nominal wages were higher, provided prices were still higher.

According to him there is no need to assume a stable Philips curve in order to explain the apparent tendency for an acceleration of inflation to reduce unemployment. That can be explained by the impact of unanticipated changes in nominal demand on markers characterized by (implicit or explicit) long-term commitments with respect to both capital and labour. Long-term labor commitments can be explained by the cost of acquiring information by employers about employees and by employees about alternative employment opportunities plus the specific human capital that makes an employee's value to a particular employer grow over time and exceed his value to other potential employers Friedman (1976).

### **2.5.3 Growth theories**

Here various theories of growth and growth models were reviewed.

#### **i) The Harrod-Domar growth model**

In economic literature, this model is called capital only model. Harrod and Domar (1948) took over from Rostow, because Rostow had some unanswered questions. The model stated that saving is a certain proportion of national income and net investment is defined as the change in capital stock (K). The model further assumes that there is some direct relationship between the size of the capital stock, (K), and total GNP, (Y). This follows that any addition to the capital stock in the form of new investment will bring about corresponding increase in

the flow of national output, GNP. This relationship is known in economics as the capital-output ratio. If the capital-output ratio is defined as  $k$  and assume further that the national savings ratio,  $s$ , is a fixed proportion of national output (e.g. 6%) and that total new investment is determined by the level of total savings, we can construct the following simple model of economic growth Balami (2006).

Savings ( $S$ ) is some proportion,  $s$ , of national income ( $Y$ ) such that we have the simple equation  $S = sY$  ----- (2.1)

Net investment ( $I$ ) is defined as the change in the capital stock,  $K$ , and can be represented by  $\Delta K$  such that  $I = \Delta K$  ----- (2.2)

But because the total capital stock,  $K$ , bears a direct relationship to total national income or output,  $Y$ , as expressed by the capital-output ratio,  $k$ , it follows that  $K/Y = k$  or  $\Delta K / \Delta Y = k$ , therefore  $\Delta K = k\Delta Y$  ----- (2.3)

Finally, because net national savings,  $S$ , must equal net national investment,  $I$ , we can write this equality as  $S = I$  ----- (2.4)

But from equation (1) we know that  $S = sY$  and from equation (2) and (3) we also know that  $I = \Delta K = k\Delta Y$  it therefore follows that we can write the ‘identity’ of savings equal to investment shown in equation (4) as  $S = sY = k\Delta Y = \Delta K = I$  ----- (2.5)

which can further be simplify as  $sY = k\Delta Y$  -----(2.6).

Dividing both sides of equation (2.6) first by  $Y$  and then by  $k$ , we obtain the following expression:

$$\Delta Y/Y = s/k \text{ ----- (2.7).}$$

The left hand side of equation (7),  $\Delta Y/Y$ , represents the rate of change or rate of growth of GNP (i.e. it is the percentage change in GNP). Equation (2.7) happen to be the simplified version of the famous equation in Harrod-Domar theory of economic growth, states simply that the rate of growth of GNP ( $\Delta Y/Y$ ) is determined jointly by the national savings ratio,  $s$ ,

and the national capital-output ratio,  $k$ . Therefore, in order to grow, economies must save and invest a certain proportion of their GNP. The more an economy can save and invest, the faster it can grow.

## ii) The Solow growth model

This is an economic growth model in which the growth of total GDP is explained by population increase, technical progress, and investment. In this model there is full employment, with an aggregate production showing constant returns to scale. In analysing the process of economic growth Brian and Howard (2005), Solow (2002) combined the supply and demand sides of the economy together to generate economic growth. He argued that economic growth can best be understood from neo-classical point of view (supply side) which says  $Q = f(AK^\alpha L^{1-\alpha})$ . Hence, the Solow model can also be referred to as the neo-classical growth model. He assumed that savings is a linear function of income, that capital does not depreciate so that investment is simply the rate of increase of capital stock, that savings is equal to investment, and that labour grows at an exogenous constant proportion, the rate of growth or level of technology is exogenously given. Hence the Solow model can also be referred to as the neo-classical growth model.

### Assumption

- i. Saving is a linear function of income:  $S = sY$

where  $S = MPS$  and lies between 0 and 1.

- ii. He assumed that  $K$  does not depreciate so that  $I$  is simply the rate of increase of capital stock

$$I = \delta k / \delta t \text{ or } K^*$$

$$\text{i.e. } K_t - K_{t-1}$$

- iii.  $I = S$

$$S = K^* \text{ and } K^* = sY$$

- iv. The Labour grows at an exogenous constant proportion rate I.e.  $L_t = L_0 E^{nt}$

Where  $n$  is the rate of growth of population. In other words, population grows at a constant proportional rate  $n$ . The rate of growth or level of technology is exogenously given at a rate  $g$ . Note that the rate of technology development is determined outside the economy.

According to Balami (2006) In the long run, the rate of growth of (per capita) GDP is determined by population growth and the rate of technical progress. Higher investment can speed up growth temporarily, but as the capital-output ratio rises, an increased proportion of GDP needs to be invested to equip the increasing labour force, and the capital-output ratio converges towards a finite limit, however high a proportion of GDP is invested. Low investment slows down growth, but the capital-output ratio falls towards a lower limit which is always positive for positive investment.

### **iii) The Lewis Theory of Growth/Development**

According to Todaro and Stephen (2011) one of the best-known early theoretical models of development that focused on the structural transformation of a primarily subsistence economy was that formulated by Nobel laureate W. Arthur Lewis in the mid-1950s and later modified, formalized, and extended by John Fei and Gustav Ranis in 1997. The Lewis two-sector model became the general theory of the development process in surplus-labour developing nations during most of the 1960s and early 1970s, and it is sometimes still applied, particularly to study the recent growth experience in China and labour markets in other developing countries.

In the Lewis model, the underdeveloped economy consists of two sectors: a traditional, overpopulated rural subsistence sector characterized by zero marginal labour productivity-a situation that permits Lewis to classify this as surplus labor in the sense that it can be withdrawn from the traditional agricultural sector without any loss of output-and a

high-productivity modern urban industrial sector into which labour from the subsistence sector is gradually transferred. The primary focus of the model is on both the process of labour transfer and the growth of output and employment in the modern sectors. (The modern sector could include modern agriculture, but we will call the sector “industrial” as a shorthand). Both labour transfer and modern-sector employment growth are brought about by output expansion in that sector. The speed with which this expansion occurs is determined by the rate of industrial investment and capital accumulation in the modern sector. Such investment is made possible by the excess of modern-sector profits over wages on the assumption that capitalists reinvest all their profits. Finally, Lewis assumed that the level of wages in the urban industrial sector was constant, determined as a given premium over a fixed average subsistence level of wages in the traditional agricultural sector. At the constant urban wage, the supply curve of rural labour to the modern sector is considered to be perfectly elastic (Todaro and Stephen (2011)).

#### **iv) The new growth theory (Romer, 1990)**

New Growth Theory is based on a view of the economy that incorporates two important views. First, it views technological progress as a product of economic activity. Previous theories treated technology as a given, or a product of non-market forces. New Growth Theory is often called “endogenous” growth theory, because it internalizes technology into a model of how markets function. Second, New Growth Theory holds that unlike physical objects, knowledge and technology are characterized by increasing returns, and these increasing returns drive the process of growth (Balami (2006)).

This new theory addresses the fundamental questions about what makes economies grow: Why is the world measurably richer today than a century ago? Why have some nations grown more than others? The essential point of New Growth Theory is that knowledge drives growth.

Because ideas can be infinitely shared, ideas could be accumulated without limit. They are not subject to what economists call “diminishing returns.” Instead, the increasing returns to knowledge propel economic growth.

New Growth Theory helps to make sense of the on-going shift from a resource-based economy to a knowledge-based economy. It underscores the point that the economic processes which create and diffuse new knowledge are critical to shaping the growth of nations, communities and individual firms. According to Romer (1993), all increases in standards of living can be traced to discoveries of more valuable arrangements for the things in the earth’s crust and atmosphere. No amount of savings and investment, no policy of macroeconomic fine-tuning, no set of tax and spending incentives can generate sustained economic growth unless it is accompanied by the countless large and small discoveries that are required to create more value from a fixed set of natural resources Romer (1993, p. 345), emphasized that people tend to focus on the computer and the Internet as the icons of economic progress, but it is the process that generates new ideas and innovations, not the technologies themselves, that is the force that sustains economic growth.

Romer (1993) is credited with stimulating New Growth Theory, but as Romer himself noted, (Romer 1994) there is really nothing new about the theory itself. The central notion behind New Growth Theory is increasing returns associated with new knowledge or technology. The cornerstone of traditional economic models is decreasing or diminishing returns, the idea that at some point as you increase the output of anything (a farm, a factory, a whole economy) the addition of more inputs (work effort, machines, land) results in less output than did the addition of the last unit of production. Decreasing returns are important because they result in increasing marginal costs (that is, at some point, the cost of producing one more unit of production is higher than the cost of producing the previous unit of production). Decreasing returns and rising marginal costs are critical assumptions to getting the mathematical

equations economists use to describe the economy to be settling down to a unique equilibrium.

## **2.6 Review of empirical literature**

Here empirical literature on the relationship between economic growth, unemployment and inflation were reviewed.

Obadan (1992) conducts empirical study on direct investment in Nigeria and found a positive and statistical significant relationship between economic growth and FDI inflow.

Ekpo (1995) regresses the disaggregated components of government capital expenditures on private investment, using ordinary least squares approach with annual data for 1960-90. The findings showed that capital expenditures on transport and communication, agriculture, health and education positively influence private investments in Nigeria, which invariably enhances the growth of the overall economy.

Ogiogio (1995) examines the growth impact of recurrent, capital and sectoral expenditures over the period 1970-93. He observed the existence of long-run relationship between economic growth and government expenditures. The study also indicated that government investment programmes in socio-economic infrastructure provided a conducive environment for private-sector-led growth.

Oduola (1996) adopts a simultaneous equations model to capture the interrelationship between military expenditures and economic growth in Nigeria. He observed that aggregate military expenditure was negatively related to growth at 10 per cent significant level. And when decomposed into recurrent and capital military expenditures, the former was more growth retarding than the latter.

Omoke and Ugwuanyi (2010) test the relationship between money, inflation and output by employing cointegration and Granger-causality test analysis. The findings revealed no existence of a cointegrating vector in the series used. Money supply was seen to Granger

cause both output and inflation. The results suggest that monetary policy can contribute towards price stability in Nigerian economy since the variation in price level is mainly caused by money supply. This shows that inflation in Nigeria is to much extent a monetary phenomenon. They find empirical support in context of the money-price-output hypothesis for Nigerian economy. M2 appears to have a strong causal effect on the real output as well as prices.

Adofu (2010) conduct a study on the role of FDI in accelerating the rate of economic growth in Nigeria. He employed OLS regression techniques and found a positive relationship between FDI inflow and GDP.

Aminu and Anono (2012) investigate the effect of inflation on economic growth and development in Nigeria. They employed OLS, ADF and Granger causality and found that there is a positive correlation between inflation and economic growth in Nigeria, though the results revealed that the coefficient of inflation is not statistically significant, but is consistence with the theoretical expectation, causation runs from GDP to inflation implying that inflation does not Granger cause GDP but GDP does.

Bakere (2012) conduct a study on stabilization policy, unemployment crises and economic growth in Nigeria. He used OLS and found that the nexus between inflation, unemployment and economic growth in Nigeria were negative.

Rafindadi (2012) conducts a study on the relationship between output and unemployment dynamics in Nigeria; and used OLS and Threshold model. He found a negative nonlinear relationship between output and unemployment.

Innocent et'al (2012) conduct a study on Economic growth and foreign direct investment in Nigeria; they used OLS and Granger causality techniques and found that foreign direct investment (FDI) impacted positively and insignificantly on economic growth proxy by GDP. The causality result indicated bidirectional causality between FDI and GDP.

Aminu, Manu and Salihu (2013) investigate the effect of unemployment and inflation on economic growth in Nigeria. The study covers 1986-2010. They used OLS, Augmented Dickey-Fuller technique, Granger causality and Johansen cointegration technique and found that both unemployment and inflation impacted positively on the economic growth in Nigeria.

Very recently, economists have also considered the effects of fiscal policies on aggregate output. Attempts have been made to investigate the extent to which government activities affect economic growth. For instance, Ratner (1983), Aschauer (1989) and Munnell (1990) found that government investments were positively related to growth. Other studies such as Evans and Karas (1994), on the other hand, produced a mixed result.

The adoption of ordinary least squares reveals a positive correlation between the two proxies of government spending (services and capital spending) and economic growth. But when a two-stage least squares techniques were used, a positive relationship could not be established in most cases, especially in public capital.

Amin (1998) examined the effects of public investment expenditures on growth of Cameroon's economic activities. Using an aggregate production function, he discovered a positive relationship between the two, even though the relationship could not be statistically established.

Joao and Francisco (2001) conduct research on does high inflation affect growth in the long and short-run in Brazil?. They used Vector Autoregressive technique. They found a zero long-run response of output to a permanent inflation shock in the context of a high inflation country, and that inflation and output are reliably related in the long-run. The results indicated that in the short-run, there is a negative impact of inflation on output.

Mohsin and Abdelhak (2001) conduct research on threshold effects in the relationship between inflation and growth (a comparative study of industrial and developing countries)

and found that the threshold is lower for industrialized countries than it is for developing countries. They also found negative and significant relationship between inflation and growth above the threshold level. They suggested low inflation for sustainable growth.

Vikesh and Subrina (2004) conduct research on the relationship between inflation and economic growth in Fiji, they used simple correlation and causality techniques and found that there was a weak negative correlation between inflation and growth, while a change in output bears significant bearing on inflation. The causality between the two variables ran one-way from GDP growth to inflation.

Williams and Adedeji (2004) examine price dynamics in the Dominican Republic by exploring the joint effects of distortions in the money and traded-goods markets on inflation, holding other potential influences constant. They captured the remarkable macroeconomic stability and growth for period 1991 to 2002. Using a parsimonious and empirically stable error-correction model, they found that the major determinants of inflation were changes in monetary aggregates, real output, foreign inflation, and the exchange rate. However, there was an incomplete pass-through of depreciation from the exchange rate to inflation. They also established a long-run relationship in the money and traded-goods markets, observing that inflation was influenced only by disequilibrium in the money market.

Ayesha and Rukhsana (2010) investigate the impact of inflation and economic growth on unemployment in Pakistan. They used Augmented Dickey Fuller test and Johansen- Juselius Maximum Likelihood techniques. They found that inflation significantly increased unemployment in the long term; economic growth had a significantly adverse impact on unemployment in the long run and short run respectively.

Fakhri (2011) conducts research on the relationship between inflation and economic growth in Azerbaijan, he used Threshold model and found that there is a nonlinear relationship between inflation and economic growth with the threshold level of 13%.

Faraji and Kenani (2011) investigate the impact of inflation on economic growth in Tanzania. They used correlation coefficient and cointegration techniques. They found that inflation impacted negatively on economic growth, and no cointegration between inflation and economic growth during the period of study.

Chang-Shuai Li and ZI-Juan Liu (2012) conduct a study on the relationship among Chinese unemployment rate, economic growth and inflation; they employed Granger causality test, unit root, cointegration, VAR and VEC model. The study revealed that unemployment impacted negatively on growth while inflation impacted positively on growth in China. The study also revealed no causation between unemployment and inflation, but there is causation between unemployment and growth, while two-way causation existed between inflation and growth. Mahmoud (2013) conducts study on the impact of inflation and unemployment on Jordanian GDP. He used simple correlation coefficient and ANOVA and found that inflation impacted positively on Jordanian GDP, while unemployment impacted negatively on Jordanian GDP. Much of the studies were from developed countries with few studies on developing countries like Nigeria.

## **CHAPTER THREE:**

### **RESEARCH METHODOLOGY**

#### **3.1 Framework for methodology**

Unemployment and inflation are two intricately linked economic concepts. Over the years there have been a number of economists trying to interpret the relationship between growth, inflation and unemployment. There are two possible explanations of this relationship – one in the short term and another in the long term. In the short term there is an inverse correlation between the three. As per this relation, when unemployment is low and inflation on the high side, economic growth is expected to be high.

The relationship between unemployment and inflation was first of all studied by Phillips(1958). He found an inverse relationship between unemployment and inflation in UK. In the short term the Phillips curve could be a declining curve. The Phillips curve in the long term is separate from the Phillips curve in the short term. It has been observed in the literature that in the longrun unemployment and inflation are not related.

The Okun's (1962) law suggests that in the US, the ratio between and a shift in output is the law through which GDP shift from the trend is enlarged by approximately 3percent if unemployment rate grows by 1percent above its natural rate level (McConnel and Brue,1996). This ratio is better known as Okun's law. In his earlier researches he concluded that this ratio was approximately 3 to 1, but after some later analyses the ratio of 2 or 2.5 to 1 was accepted as the representative one. Okun's law is a reduced version of the Phillips regularity, more precisely, of the segment pertaining to the research of the relation between unemployment and output. Okun's law has been used for specific projections of economic growth. When there are no vacancies for those willing to work, potential output is irrevocably lost. Unrealised output is measured by shift from the long-term tendency of GDP growth and it is called "GDP gap". When GDP follows trend line, economy trends can be projected and

then there is natural unemployment rate. The higher the unemployment rate, the greater the shift of GDP from its trend Popovic and Popovic, (2009). The Okun's law and the Phillips postulate are the basis for the analysis of the effect of unemployment and inflation on growth as used in this thesis. The Okun's model was adopted and modified to incorporate inflation on the growth of the Nigerian economy.

### **3.2 Empirical Framework**

This Thesis used multi-dimensional econometric procedure in estimating the effect of unemployment and inflation on economic growth in Nigeria. The Ordinary Least Squares (OLS) techniques, and double log were employed to obtain the coefficients of the equation, the double log technique was used in estimating the elasticities of unemployment and inflation on growth, Augmented Dickey-Fuller and Phillips-Perron tests were employed to test the presence of unit root in the series, after which Johansen cointegration test was employed to test the existence of long-run relationship between economic growth and the independent variables.

**Regression analysis:** - This Thesis used multiple regression analysis where the rate of growth (ECGR) serves as the dependent variable, while unemployment rates (UN), inflation rates (INF), serve as the explanatory variables.

### **3.3 Expected result of the study**

It is expected in this study that unemployment is negatively related with economic growth. However, inflation is expected to be positively related to economic growth.

### **3.4 Models specification**

This Thesis adopted model of growth by Aminu and Anono (2012) and incorporate unemployment. The models estimated were specified as follows:-

## **LINEAR FORM**

### **Model I**

$$ECGR = f(UN)$$

Where ECGR is the rate of growth of the economy and UN is unemployment rate. The model was specified as follows

$$ECGR = \alpha_0 + \alpha_1 UN + \mu_1$$

### **A priori expectation**

It is expected that  $\alpha_0 > 0$  and  $\alpha_1 < 0$ .

### **Model II**

$$ECGR = f(UN, INF)$$

Where ECGR and UN as defined above, and INF is inflation rate. The model was specified as follows

$$ECGR = \beta_0 + \beta_1 UN + \beta_2 INF + \mu_2$$

### **A priori expectation**

It is expected that  $\beta_0$  and  $\beta_2 > 0$ ,  $\beta_1 < 0$ .

## **DOUBLE LOG FORM**

### **Model III**

$$\text{LogECGR} = f(\text{LogUN}, \text{LogINF})$$

Where LogECGR is the natural log of ECGR, LogUN, LogINF, is the natural log of unemployment, and inflation. The model was specified as follows

$$\text{LogECGR} = \text{Log}\lambda_0 + \lambda_1 \text{LogUN} + \lambda_2 \text{LogINF} + \text{Log}\mu_3$$

The coefficients of the variables in this case served as the constant elasticities of the unemployment and inflation to economic growth rate in Nigeria.

### **A priori expectation**

It is expected that  $\lambda_0, \lambda_2 > 0$  and  $\lambda_1 < 0$ .

These models assumed that output depends on employment of labour and capital which when fully employed assist the economy to grow. Inflation sets in at full employment.

### 3.5 Diagnostic Test

The diagnostic tests which this Thesis employed were Augmented Dickey-Fuller (ADF), Phillips-Perron, and Johansen cointegration test.

#### Augmented Dickey-Fuller Test.

ADF test was developed first Dickey-Fuller (1976) to test for the existence of unit root in a given time series data. The basis for this test is when the assumption of non-autocorrelation between the disturbance terms is violated. According to him there is a tendency for time series data to contain a unit root. Consequently, an attempt has to be made to render the data stationary prior to specification and estimation. Moreover, as the residuals of non-stationary time series could be correlated with their own lagged values, the assumption of OLS theory that disturbances are not correlated with each other is violated. Hence, OLS estimates of such series are biased and inconsistent, and standard errors computed with such random walk variables are generally underestimated. In this case, OLS is no longer efficient among linear estimators (Ndiyo 2003).

The model of unit root is specified as follows

$$\Delta ECGR_t = \phi ECGR_{t-1} + \epsilon_t \text{ --- --- --- } 3.6.1a$$

$$\Delta UN_t = \phi UN_{t-1} + \epsilon_t \text{ --- --- --- } 3.6.1b$$

$$\Delta INF_t = \phi INF_{t-1} + \epsilon_t \text{ --- --- --- } 3.6.1c$$

**Decision Rule:** The null hypothesis  $\phi = 1$ , i.e. a unit root exist in ECGR, UN and INF (ECGR, UN, INF are non-stationary) but when  $\phi < 1$ , i.e. a unit root does not exist in ECGR, UN and INF (ECGR, UN, INF are stationary) . The decision rule as to whether to accept the null hypothesis or not is that ADF statistics should be less than critical t-value at certain percent level, and hence unit root exist; but if ADF statistics is greater than the critical t-value

at certain percent, then the null hypothesis is reject, hence, there is no unit root and ECGR is stationary. This is similar to all the variables of the model.

**Phillips-Perron (PP) Test.**

Phillips-Perron (1988) proposed an alternative (non-parametric) method of controlling for serial correlation when testing for unit root. The PP method estimates the non-augmented DF equation and modifies the t-ratio of  $\alpha$  coefficient so that serial correlation does not affect the asymptotic distribution of the statistics.

The model is specified as follows:

$$ECGR_t = \mu + \phi ECGR_{t-1} + \epsilon_t \text{ --- --- --- --- } 3.6.2a$$

$$UN_t = \mu + \phi UN_{t-1} + \epsilon_t \text{ --- --- --- --- } 3.6.2b$$

$$INF_t = \mu + \phi INF_{t-1} + \epsilon_t \text{ --- --- --- --- } 3.6.2c$$

**Decision Rule:** The null hypothesis  $\phi = 1$ , i.e. a unit root exist in ECGR, UN and INF (ECGR, UN, INF are non-stationary) but when  $\phi < 1$ , i.e. a unit root does not exist in ECGR, UN and INF (ECGR, UN, INF are stationary). The decision rule as to whether to accept the null hypothesis or not is that PP statistics should be less than critical t-value at certain percent level, and hence unit root exist; but if PP statistics is greater than the critical t-value at certain percent, then the null hypothesis is reject, hence, there is no unit root and ECGR is stationary.

This is similar to all the variables of the model.

**Johansen cointegration test**

Cointegration is a diagnostic test to determine whether there is a long run relationship between two or more variables in a model. When time series variables are non-stationary, it is interesting to see if there is a certain common trend between those non-stationary series. If two non-stationary series  $X_t \square I(1)$  has a linear relationship such that  $Z_t = m + \alpha X_t + \beta Y_t$  and  $Z_t \square I(0)$ , ( $Z_t$  is stationary), then the two series  $X_t$  and  $Y_t$  are cointegrated. It is always employed when simple causality test fail to establish such relationship in the short run.

Whenever the variables are found to be related in the long run, it then follows that the variables can affect each other in the long run. There are two broad approaches to test for the cointegration, Engel and Granger (1987) and Johansen (1988). Broadly speaking, cointegration test is equivalent to examine if the residuals of regression between two non-stationary series are stationary. This thesis employed a simple test of cointegration: the Johanson Test. Johanson develops maximum likelihood estimators of cointegrating vectors.

**Decision Rule:** The decision rules upon which to accept or not that there exist a long run relationship between variables is thus. The TRACE statistics value, Max-Eigen statistics value and the critical value at an appropriate level of significance determine whether to accept or to reject the null hypothesis. If TRACE statistics value or Max-Eigen statistics value is greater than the critical value, the null hypothesis is rejected; on the other hand, if TRACE statistics value or Max-Eigen statistics value is less than the critical value, the null hypothesis is accepted. The hypothesis indicates the number of cointegrating equation(s) and the usual levels of significance are 1 and 5 percents.

### **3.6 Sources of data**

Secondary data have been used in this Thesis. Data were sourced mainly from the publications of Central Bank of Nigeria (CBN) namely; Statistical Bulletin, as well as data from National bureau for statistic (NBS). The variables for which data were sourced include: inflation rate, and unemployment rate, and growth rate of the economy.

## CHAPTER FOUR:

### DATA PRESENTATION AND ANALYSIS

#### 4.1 Data presentation

Here data for the thesis are presented and analyzed.

**TABLE 4.1 DESCRIPTIVE STATISTICS**

	ECGR	UN	INF
Mean	4.829259	9.87037	22.14074
Median	4.89	7	13.7
Maximum	11.36	24.7	76.8
Minimum	-0.69	1.8	0.2
Std. Dev.	3.057397	7.299779	20.41902
Skewness	0.06541	0.570263	1.384095
Kurtosis	2.352165	2.040844	3.613286
Jarque-Bera	0.491404	2.498378	9.04387
Probability	0.782155	0.286737	0.010868
Sum	130.39	266.5	597.8
Sum Sq. Dev.	243.0396	1385.456	10840.35
Observations	27	27	27

Source: E-views 7

Table 4.1 shows that Nigerian economy was growing on the average at 4.8293 percent, the maximum economic growth rate from 1986-2012 in Nigeria is 11.36 while the minimum growth rate of the economy stood at -0.69 percent. Jarque-Bera value of 0.4914 and the probability value of 0.7822 shows that economic growth rate was normally distributed since the null hypothesis of normality is accepted at 78.22 percent..

Unemployment rates stood at 9.48 percent on the average from 1986-2012 in Nigeria. The maximum unemployment rate from 1986-2012 in Nigeria was 19.7 while the minimum unemployment rate stood at 1.8 percent. Jarque-Bera value of 2.4984 and the probability value of 0.2867 shows that economic unemployment rate was normally distributed since the null hypothesis of normality is accepted at 28.67 percent.

Inflation rate stood at 22.14 on the average from 1986-2012. The maximum inflation rate from 1986-2012 in Nigeria was 76.8 while the minimum inflation rate stood at 0.2 percent. Jarque-Bera value of 9.0439 and the probability value of 0.0109 shows that inflation rate was not normally distributed since the null hypothesis of normality was rejected at 1.09 percent.

## 4.2 EMPIRICAL RESULTS AND DISCUSSION

**Table 4.2 Growth effects of unemployment and inflation.**

Variables	Model I	Model II	Model III
CONST	7.0563 (8.6455) P(0.0000)	6.9352 (8.1196) P(0.0000)	613940 (4.4677) P(0.0002)
UN	-11.6544 (3.4309) P(0.0021)	-13.0541 (3.0888) (0.0050)	-730232 (2.8220) P(0.0105)
INF		0.0176 (0.5713) P(0.5731)	423.0465 (0.2166) P(0.8307)
R2	0.3201	0.3292	0.2611
R2 Ajusted	0.2929	0.2733	0.1969
F-stat.	11.7709	5.8900	4.0637
P(F-stat)	0.0021	0.00083	0.0308

DW-stat.	1.7520	1.7511	2.4267
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Source: Regression Results using EVIEW 7

Table 4.2 contains both simple and multiple regression results for the growth model. Model I represents the growth effect of unemployment rates in Nigeria. The constant and coefficient of unemployment were statistically significant at 1 per cent significance level both. The coefficient of unemployment significantly and negative affected economic growth rate in Nigeria. This is consistent with the theoretical expectation of this study and the Okun's law; this may be attributed to the manifestation of unemployment in Nigeria. The dominant manifestation of unemployment in Nigeria was structural. This result therefore, implied that as unemployment increases by 1 per cent economic growth rate reduces by 11.6544 per cent as indicated in model I above. The F-statistics 11.7709, which measured the joint significance of the parameter estimates, was also found statistically significant at 1 per cent level as indicated by the corresponding probability value of 0.0021. This implies that all the parameters of the model were statistically significant affected economic growth rate in Nigeria.

The  $R^2$  value of 0.3201 (32.01%) implied that 32.01per cent total variation in economic growth rate was explained by unemployment in Nigeria. This further indicated that economic growth rate was not significantly explained by unemployment. Coincidentally, the goodness of fit of the regression remained low after adjusting for the degree of freedom as indicated by the adjusted  $R^2$  ( $R^2 = 0.2929$  or 29.29%). The Durbin-Watson statistic 1.7520 in table 4.2 was observed to be higher than  $R^2$  0.3201 indicating that the model is non-spurious (meaningful). The Durbin-Watson statistics 1.7520 shows that there was some serial correlation among the error value though negligible thus making it possible to conduct a unit root test.

Model II represents the growth effect of both unemployment rates and inflation rates in Nigeria. The constant and the coefficient of unemployment were found statistically

significant at 1 per cent as indicated by their probability values of 0.0000 and 0.0050. The coefficient of unemployment significantly and negatively affected economic growth rate in Nigeria. This also confirm the Okun's law and consistent with the theoretical expectation of this study. The coefficient of inflation was found statistically insignificant as indicated by its high probability value of 0.5731. The coefficient of inflation was insignificantly but positively affecting economic growth rate in Nigeria. This is consistent with the theoretical expectation of this study. This result, therefore, implied that as unemployment rates increases by 1 per cent economic growth rate decreases by 13.0541 per cent and increase in inflation rates by 1 per cent increases economic growth rate by 0.0176 per cent as shown in table 4.2 models II above. The F-statistics 5.8900, which measured the joint significance of the parameter estimates, was found statistically significant at 1 per cent level as indicated by the corresponding probability value of 0.0083. This implies that all the variables of the model were statistically and jointly significant affected economic growth rate in Nigeria. This result further indicated that both unemployment rates and inflation rates affects economic growth rate in Nigeria which if properly control may translate to improvement in economic growth rate.

The  $R^2$  value of 0.3292 (32.92%) implied that 32.92per cent total variation in economic growth rate was explained jointly by unemployment rates and inflation rates in Nigeria. This further indicated that economic growth rate was not significantly explained by unemployment rates and inflation rates. Coincidentally, the goodness of fit of the regression remained very low after adjusting for the degree of freedom as indicated by the adjusted  $R^2$  ( $R^2 = 0.1969$  or 19.69%). The Durbin-Watson statistic 1.7511 was observed to be greater than  $R^2$  0.3292 indicating that the model is non-spurious (meaningful) and can be used for policy. Durbin-Watson statistics 1.7511 showed there was negligible positive serial correlation among the error value thus making it possible to conduct a unit root test.

Model III represents the double log model that showed the growth effect of unemployment rates (UN), and inflation rates (INF), in Nigeria. The coefficients of the included variables served as their elasticities (the extent to which economic growth rate in Nigeria changes with respect to change in unemployment rates and inflation rates. The relatively high unemployment rates elasticity shows that economic growth in Nigeria was highly susceptible to change in unemployment rates. The coefficient of unemployment elasticity was found to be -4.6727 implying that economic growth rate in Nigeria was unemployment elastic (meaning little change in unemployment rates caused large change in economic growth rate in negative direction; therefore more attention need to be given to the control of unemployment rates in the country. The coefficient of inflation elasticity was low, implying that economic growth rates in Nigeria was low susceptible to change in inflation rates. The coefficient of inflation elasticity was found to be 0.0246 implying that economic growth rate in Nigeria was inelastic elastic (meaning large change in inflation rates caused little change in economic growth rate in positive direction; therefore more attention need to be given to the stabilization of prices (inflation rates) in the country. Unemployment rates was found significantly affecting economic at 1 per cent as indicated by its probability value of 0.0100; this implied that 1 per cent increase in unemployment rates will reduce economic growth rates by 4.6727 per cent. Inflation was found insignificantly affecting economic growth rates as indicated by its high probability value of 0.2611; the coefficient of inflation 0.0246 implied that 1 per cent increase in inflation will increase economic growth rates by 0.0246 per cent. Model III supported the previous results. Even though, some of the variables of this model were found statistically insignificant individually, but the F-statistics value of 4.0637, which measured the joint significance of the variables, was found statistically significant at 5 per cent level as indicated by the corresponding probability value of 0.0308. This implies that all the variables of the model were statistically significant and affected economic growth rate

in Nigeria. This result was in agreement with the previous results and also showed that all the variables of the model were consistent with theoretical expectations of this thesis.

The  $R^2$  value of 0.2611 (26.11%) implied that 26.11 per cent total variation in economic growth rate was explained jointly by unemployment rates and inflation rates in Nigeria. This further indicated that economic growth rate was not significantly explained by the included variables of the model since  $R^2$  was less than 50 per cent. The goodness of fit of the regression was found low after adjusting for the degree of freedom as indicated by the adjusted  $R^2$  ( $R^2 = 0.1969$  or 19.69%). The Durbin-Watson statistic 2.4267 in table 4.2 was observed to be greater than  $R^2$  0.2611 also indicating that the model is non-spurious (meaningful). The Durbin-Watson statistics 2.4267 showed the absence/negative serial correlation among the error value.

The regression results of model I to III showed that economic growth rate has a significant positive intercept, signifying that there are other exogenous variables that may have significant impact on the economic growth but not captured in the model. This was consistent with the Keynesian position that GDP and economic growth has an autonomous component. Summarily, unemployment rates was observed to affect economic growth rates negatively which translate to reduction economic growth rate in Nigeria, inflation rates was observed to affect economic growth rates positively, which may translate to increase in economic growth rate.

### **4.3 HYPOTHESIS TESTING**

Here, the afore formulated hypothesis in chapter one was tested at 5% level and the rule of thumb, through the application of F-Statistic which test the joint significant of the variables of the model. Given the rule of thumb that whenever F-Statistic value is at least 2 the null hypothesis that the variables are not significant is rejected and therefore, the variables of the

model are significantly and jointly affecting economic growth of the country. The hypothesis is as follows:

H<sub>0</sub>: Unemployment and inflation have no effect on economic growth in Nigeria.

H<sub>1</sub>: Unemployment and inflation have effect on economic growth in Nigeria.

Given the F-Statistic value of 5.8900 and 4.0637 in model II and III respectively, in table 4.2 showed that unemployment rates and inflation rates were jointly and significantly affecting economic growth rate in Nigeria. The null hypothesis (H<sub>0</sub>) above was rejected at 1% and 5% level respectively as indicated by the F-Statistic probability values of 0.0083 and 0.0308 respectively. In conclusion, therefore, both unemployment rates and inflation rates have significant effect on economic growth rates in Nigeria.

**Table 4.3 Correlation coefficients Results**

CORRELATION MATRIX

	ECGR	UN	INF
ECGR	1.00000		
UN	-0.73746	1.00000	
INF	0.31437	0.460721	1.00000

**Source: Computer Output**

Table 4.3 contains the correlation coefficients which show the extent or degree of relationship between economic growth and unemployment rates and inflation rates. The simple correlation between growth rate of the economy and unemployment was negative, and between growth rate of the economy and inflation rate was positive. This implies that as unemployment rate increases, the rate of growth of the economy decreases, but economic growth rate increase as inflation rate, increases. Economic growth rates was found highly negative related to unemployment as indicated by its correlation value of -0.73746 while

lower positively related to inflation as indicated by its correlation value of 0.31437. This also confirmed the regression results in table 4.2 and corroborated theoretical expectation.

**Table 4.4: Unit root test**

VAR	ADF 1(0)	CRITICAL (5%)	ADF 1(1)	CRITICAL VAL (5%)	PP 1(1)	CRITICAL VAL (5%)	REMARK	PROB. (ADF)	PROB. (PP)
ECGR	- 2.662	-2.99	- 5.174	-3.005	- 7.536	-2.998	1 (1)	0.0004*	0.0000*
UN	- 0.733	-2.992	- 6.186	-3.753	- 4.991	-2.998	1 (1)	0.0000*	0.0006*
INF	- 2.988	-2.998	- 4.684	-3.77	- 6.133	-2.998	1 (1)	0.0001*	0.0000*

**\*Stationary at 1percent**

**ADF = Augmented Dickey Fuller Statistics**

**PP = Phillips-Perron Statistics**

#### **4.4. Discussion of unit root test results**

The results of unit root test were contained in table 4.4. The results of both ADF and PP revealed that all the variables of the model were stationary at 1percent as indicated by their probability values. The result further indicated that economic growth rate (ECGR), unemployment rate (UN) and inflation rate (INF) were stationary at first difference 1(1). The ADF and PP statistics for all the variables are less than the critical values in negative direction.

#### **4.5: Discussion of cointegration results**

The Johansen cointegration test results contain in appendix (ii) confirmed the existence of long-run relationship between the growth rates of economy (economic growth),

unemployment and inflation as indicated by the TRACE-Statistic. The TRACE-statistics results revealed that there was 2 cointegrating equation at 5 per cent level. The Max- Eigen-statistics results revealed that there was 1 cointegrating equation at 5 per cent level. Overall, these results are in agreement with similar study on Nigeria conducted by Aminu and Anono (2012) on the long run relationship between unemployment, and inflation in Nigeria.

**Table 4.5 Johansen Long-run cointegrating equation**

1 Cointegrating	Log	
Equation(s):	likelihood	-4.72137
<hr/> <hr/>		
Normalized cointegrating coefficients (standard error in parentheses)		
ECGR	UN	INF
1.000000	5.70659	-0.23119
	(0.99343)	(0.18048)
T-Statistics	(5.74433)	(1.28097)
Adjustment coefficients (standard error in parentheses)		
D(ECGR)	-1.310711	
	(0.45045)	
D(UN)	-0.000841	
	(0.02831)	
D(INF)	-0.797801	
	(0.43066)	
<hr/> <hr/>		

The adjustment coefficient for D(ECGR) is -1.310711 negative implying the existence of long run relationship between economic growth, unemployment and inflation in Nigeria. The coefficient of -1.310711 shows that in the long run the variable will adjust by 131 percent to

go back to equilibrium. The long run coefficient of unemployment is 5.706590 implying the existence of negative long run relationship between unemployment and economic growth rates in Nigeria. The long run coefficient of inflation is -0.23119 implying the existence of positive long run relationship between inflation and economic growth rates in Nigeria.

#### **4.6 FINDINGS OF THE STUDY**

Major findings of this thesis were itemized below:

- (i) There was a negative and significant relationship between economic growth rates and unemployment in Nigeria during the years under review, suggesting that increase in unemployment rate reduces the rate of economic growth in the country. The Thesis found negative non-linear relationship between unemployment and economic growth rate which corroborated Rafindadi (2012). This result is consistent with the Okun,s law that increase in unemployment may reduce growth rate of output but by more than proportionate increase in unemployment. This result is consistent with the a priori expectation of the thesis.
- (ii) There was a positive and insignificant relationship between economic growth rates and inflation in Nigeria during the years under review as indicated by the overall result, suggesting that increase in inflation rate increases the rate of economic growth. This result is consistent with the a priori expectation of the thesis.
- (iii) There was a significant positive intercept, suggesting that there are other exogenous variables apart from unemployment and inflation that exact significant impact on the economic growth rate in Nigeria. This confirmed the Keynesian position that growth of the economy proxy by GDP has autonomous component.
- (iv) The simple correlation between growth rate of output (economic growth rate) and unemployment rates was negative; but positively correlated with inflation rates.

- (v) The  $R^2$  values in table 4.2 in all the models implied that less than 50 per cent total variation in economic growth rate was explained by unemployment rates and inflation rates, similarly, the goodness of fit of the regression remained low after adjusting for the degree of freedom as indicated by the adjusted  $R^2$  values of less than 50 per cent. The Durbin-Watson statistic values in table 4.2 and in all the models was observed to be higher than  $R^2$  values indicating that the models were non-spurious (meaningful) and can used for policy.
- (vi) The Durbin-Watson statistics values in model I and II were less than 2 (two) implied the presence of serial correlation, though negligible among the error value, this therefore, justified the need to conduct a unit root test. Durbin-Watson value in model III was found greater than 2 implying the absence of serial correlation thus making it possible to rely on the results of the model for policy guidance.
- (vii) The results of unit root test revealed that all the variables of the model were found to be stationary at 1percent. The result further indicated that economic growth rate (ECGR) unemployment rate (UN) and inflation rate (INF) were stationary at first difference 1(1); table 4.4. The ADF and PP statistics for all the variables are less than the critical values in negative direction.
- (viii) The Johansen cointegration test revealed the existence of long run relationship between the variables of the model suggesting that both unemployment and inflation may influence the rate of economic growth in Nigeria as indicated by the adjusted coefficient of ECGR of -1.310711 in Table 4.5.
- (ix) Finally the null hypothesis that unemployment and inflation have no significant effect on economic growth was rejected; hence, this Thesis found that unemployment and inflation had significant effect on economic growth in Nigeria.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 SUMMARY OF FINDINGS

This Thesis revealed that unemployment significantly and negatively affected economic growth in Nigeria for the period under study. The coefficients of unemployment rates and inflation rates were rightly signed, implying that they were consistent with the theoretical expectation of this Thesis. This was attributed to the dominant manifestation of unemployment and inflation in Nigeria which was caused by the techniques of production adopted in the country (labour savings and cost push inflation). This Thesis found that the type of unemployment that characterized the Nigerian economy was structural and the type of inflation characterized the country was cost-push. Nigeria had been using capital intensive technique of production which is capable of increasing cost of production and hence inflation and unemployment; economic growth rates will deteriorate, making it difficult to achieving rapid and sustained economic growth rates. It was found in this Thesis that as inflation rates increased economic growth rates increased. However, as unemployment rates increases economic growth rates decreases. The f-statistics values in table 4.2, in models II, and III which measured the joint significance of the explanatory variables, was found statistically significant at 1 percent and 5percent level respectively as indicated by the corresponding probability values of 0.0083 and 0.0308. This implies that both unemployment and inflation rates significantly affected economic growth rate in Nigeria.

The  $R^2$  values in table 4.2 are low and in all model implied that less than 50 per cent total variation in economic growth rate was explained by unemployment rates and inflation rates. Coincidentally, the goodness of fit of the regression remained weak after adjusting for the degree of freedom as indicated by the adjusted  $R^2$  values of less than 50 per cent. The Durbin-Watson statistic values in table 4.2 and in all the models was observed to be higher

than  $R^2$  values indicating that the model is non-spurious (meaningful). Durbin-Watson statistics values in model I and II were less than 2 (two) implied the presence of serial correlation among the error value, though there was a negligible serial correlation because their values were tending toward 2. This therefore, justified the need to conduct a unit root test. After taking the natural log of the data Durbin-Watson statistics value was found to be 2.4267 in model III implied the absence of serial correlation among the error values, thus making it possible to rely on the results of the model for policy guidance.

The results of unit root test were contained in table 4.4. The results revealed that all the variables of the model were found to be stationary at 1percent. The result further indicated that economic growth rate (ECGR), unemployment rate (UN) and inflation rate (INF) were stationary at first difference 1(1). The ADF and PP statistics for all the variables are less than the critical values in negative direction.

The Johansen cointegration test results confirmed the existence of long-run relationship between economic growth rate, unemployment and inflation rates as indicated by the TRACE-Statistic and also the Max- Eigen-statistics.

Unemployment rates were high (see Table 4.1). Table 4.1 shows that inflation rate was increasing in most of the years. There was no productivity, inflation and employment linkage. But literature reviewed shows that both inflation and unemployment are economic woes that hinder not only investment but also economic growth in general. Nigeria has experienced high volatility in inflation rates. Since the early 1986's, there have been three major episodes of high inflation, in excess of 30percent. Literature reviews shows that there has been high rate of unemployment in the country spurred by the privatization programme of the government which was one of the core blueprints of the structural adjustment programme (SAP). The high unemployment negatively affected economic growth. The neglect of the agricultural sector, poor enabling environment, growth in money supply, disconnect between

the institution providing the labour and industries employing them also affected economic growth. Both inflation and unemployment impacted negatively on the growth process of Nigeria. This confirms the existing literature that inflation and unemployment are macroeconomic threat to any nation. In summary, this study revealed that there was a positive relationship between economic growth rates and inflation rates. Finally the null hypothesis that unemployment and inflation have no significant effect on economic growth was rejected; because this Thesis found that unemployment and inflation significantly affected economic growth in Nigeria during the period under review.

## **5.2 CONCLUSION**

The results of OLS revealed that increase in inflation rates raised economic growth rates; while increase in unemployment rates reduced economic growth rates in Nigeria. The coefficient of unemployment was statistically significant and consistent with the theoretical expectation. The coefficient inflation rates, though found consistent with theoretical expectations of this Thesis but was statistically insignificant in determining economic growth rates in Nigeria. The F-statistics values in all models of this Thesis indicated that unemployment and inflation rates were jointly and significantly affected economic growth rates in the country at 1 percent and 5 per cent significant level. It can be concluded that there was the existence of long run relationship between economic growth, unemployment and inflation. However, both structural rigidity and unstable monetary policy was been identified as the major causes of inflation and unemployment in Nigeria (Adamson, (2000). This Thesis concluded that the major cause of unemployment in Nigeria was the method of production adopted by the government in the country. The method of production adopted in this country was capital intensive (labour savings) which was capable of increasing unemployment rates thereby reducing economic growth rates. This Thesis further concluded that the nature of inflation in the country was cost-push attributed to the method of technology adopted and the

level of poverty in the country. This will make it possible for inflation rates if regressed along to behave abnormally to growth rates of output in the country. A historical analysis of monetary policy in Nigeria within this framework suggests that monetary conditions might have been less accommodative and, hence, inflation in Nigeria might have been lower and less volatile than what was observed in the past had Nigeria followed prescriptions based on a rule consistent with price stability. In conclusion therefore, fight against unemployment and inflation in Nigeria is not going to be easy or a short run affair, this was because what brought about high unemployment rates also brought about reduction in the growth rates of output in the country and what about high inflation rates brought about improvement in the growth rates of output in Nigeria. This Thesis concluded by saying that combating the challenges of the rising inflation and unemployment level in Nigeria is not a small task for policy makers and economic managers in Nigeria. The consequences of a growing inflation and unemployment phenomenon are so damning that Nigeria cannot afford them. Such implications are glaring in the economy of Nigeria where many negative developments were traceable to the non-availability of jobs for the teeming population of energetic youths coupled with a frequent rising in general price level. Therefore, the need to aptly address this ugly development becomes paramount.

### **5.3 RECOMMENDATIONS**

Based on the findings made in the course of this study the following recommendations are made:

- i. Based on the coefficient of unemployment rate (-4.6727) in model III in Table 4.2, reduction in unemployment rate will increase economic growth rate. Precisely, 1 percent reduction in unemployment rates will increase economic growth by 4.6727 percent. This Thesis therefore, recommended that government and its relevant authorities should provide conducive investment environment by

removing the structural rigidities that exist in the economy to create jobs. Government should endeavour to provide stable supply of power, good roads for transportation of goods and people, functional legal system, security of lives and property, infrastructural facilities etc. All these would boost employment by making goods and services readily available to meet the ever increasing demand in order to prevent inflation and subsequently lead to industrial expansion and improvement in growth rates of the economy which would provide employment opportunities for the people.

- ii. Based on the coefficient of inflation rate (0.0246) in model III in Table 4.2; increase in inflation rate will increase economic growth rate. Precisely, 1 percent increase in inflation rates will increase economic growth by 0.0246 percent. This Thesis therefore, recommended the need to formulate policies to ensure relative price stability which may likely improve the welfare of Nigerians.
- iii. The coefficients of elasticities in model III revealed the extent to which unemployment rates and inflation rates affects economic growth rates in Nigeria. It was found that economic growth rates was highly susceptible to change in unemployment given the elasticity coefficient of -4.6727 which is fairly elastic and less susceptible to inflation rates given the elasticity coefficient of 0.0246 which is fairly inelastic. This Thesis therefore, recommended that more effort should be channel toward reducing unemployment than stabilizing prices.
- iv. This Thesis found that the type of unemployment and inflation characterized the Nigerian economy was structural and cost-push respectively; hence the need by the government and relevant agencies to formulate policies to encourage self-employment and reduce cost of doing business in the country so as to achieve a high, rapid and sustained economic growth.

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## APPENDICES

### Appendix i : RAW DATA ON ECONOMIC GROWTH RATE, UNEMPLOYMENT, INFLATION

YEARS	ECGR	UN	INF	1/UN
1986	1.89	5.3	13.7	0.1887
1987	-0.69	7	9.7	0.1429
1988	7.58	5.3	61.2	0.1887
1989	7.15	4.5	44.7	0.2222
1990	11.36	3.5	3.6	0.2857
1991	0.01	3.1	23	0.3226
1992	2.63	3.4	48.8	0.2941
1993	1.56	2.7	61.3	0.3704
1994	0.78	2	76.8	0.5
1995	2.15	1.8	51.6	0.5556
1996	4.13	3.4	14.3	0.2941
1997	2.89	3.2	10.2	0.3125
1998	2.82	3.2	11.9	0.3125
1999	1.19	3	0.2	0.3333
2000	4.89	18.1	14.5	0.0553
2001	4.72	13.7	16.5	0.073
2002	4.63	12.2	12.2	0.082
2003	10.2	14.8	23.8	0.0676
2004	6.58	11.8	10	0.0848
2005	6.51	11.9	11.6	0.0843
2006	6.03	13.7	8.5	0.073
2007	6.45	14.6	6.6	0.0685
2008	5.98	14.9	15.1	0.0671
2009	6.96	19.7	13.9	0.0508
2010	7.98	21.1	11.8	0.073
2011	7.43	23.9	10.3	0.0418
2012	6.58	24.7	12	0.0405

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## Appendix ii :Cointegration test results

Sample (adjusted): 1990 2012  
 Included observations: 23 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: LOGECGR LOGUN LOGINF  
 Lags interval (in first differences): 1 to 1

### Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.587253	36.82465	29.79707	0.0066
At most 1 *	0.474851	16.47151	15.49471	0.0355
At most 2	0.069543	1.657818	3.841466	0.1979

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

### Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.587253	20.35314	21.13162	0.0640
At most 1 *	0.474851	14.81369	14.26460	0.0409
At most 2	0.069543	1.657818	3.841466	0.1979

Max-eigenvalue test indicates 1 cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

### Unrestricted Cointegrating Coefficients (normalized by b\*S11\*b=I):

LOGECGR	LOGUN	LOGINF
1.532350	8.744491	-0.355688
0.071823	3.991002	-1.417061
0.094273	-6.287476	-0.071084

### Unrestricted Adjustment Coefficients (alpha):

D(LOGECGR)	D(LOGUN)	D(LOGINF)
-0.855361	-0.027454	-0.268884
0.000549	-0.038017	0.014681
-0.520639	0.645514	0.156849

1 Cointegrating Equation(s):      Log likelihood      -41.48356

### Normalized cointegrating coefficients (standard error in parentheses)

LOGECGR	LOGUN	LOGINF
1.000000	5.706590	-0.232119
	(0.99343)	(0.18048)

### Adjustment coefficients (standard error in parentheses)

D(LOGECGR)      -1.310711

	(0.45045)
D(LOGUN)	0.000841
	(0.02831)
D(LOGINF)	-0.797801
	(0.43066)

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2 Cointegrating Equation(s):      Log likelihood      -34.07671

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Normalized cointegrating coefficients (standard error in parentheses)

LOGECGR	LOGUN	LOGINF
1.000000	0.000000	1.999421
		(0.52953)
0.000000	1.000000	-0.391046
		(0.08726)

Adjustment coefficients (standard error in parentheses)

D(LOGECGR)	-1.312683	-7.589262
	(0.45084)	(2.82494)
D(LOGUN)	-0.001890	-0.146929
	(0.02478)	(0.15528)
D(LOGINF)	-0.751438	-1.976476
	(0.36250)	(2.27139)

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