CHAPTER ONE

INTRODUCTION

1.1 Problem statement

One of the greatest macroeconomic challenges currently facing Nigeria is rising unemployment, which has remained unstoppable despite the good economic growth outcome experienced between 1981 and 2014. Iyoha (1978) and other researchers after him (such as Ajilore and Yinusa, 2011; and, Mikhize, 2015) had identified the most critical development challenge facing the less developed countries, including Nigeria, as chronic unemployment. Growth is expected to create jobs through the demand for more labour required in the process of executing increased economic activities arising from economic expansion and increasing demand for consumer goods and services (Ajilore and Yinusa, 2011). However, despite strong growth performance of the Nigerian economy between 1981 and 2014 unemployment remained high, rising and unstoppable. Available data indicated that unemployment has maintained an upward trajectory over the last few decades, and that women and the youth are most affected.

Up until the outset of the recent recession, the Nigerian economy recorded general improvements in the non-oil sector, with positive real GDP growth. Agriculture, trade and services were the main influencers of non-oil sector growth. The corresponding oil sector growth performance was not as impressive during the period. The growth performance of the oil sector has further become worrisome lately due to supply disruptions occasioned by oil pilferage, wilful pipeline destruction in the Niger Delta, low investment in upstream activities as a consequence of which there are no major new oil finds (CBN, 2015).

Table 1: Real growth by sectors (1981-2015)

Sectors	1981-90	1991-00	2001-07	2011	2012	2013	2014	2015
Non-oil GDP	2.8	2.9	7.2	5.4	8.3	7.8	7.3	3.6
Oil GDP	4.2	0.8	0.6	3.4	(2.3)	5.3	(1.3)	(5.4)
Total GDP	3.2	2.1	5.6	4.8	6.7	7.4	6.3	2.7

Source: United Nations Development Programme (UNDP) 2009 CBN, 2015

Contrary to expectations, however, unemployment has been on the rise (See Figure 1 overleaf and Appendix 1). According to Triechel (2010) good economic growth performances had little effect on the labour market. Although, new jobs have been created in family agriculture where family income has also almost doubled in real terms; wage employment has declined and youth unemployment seems to be on the rise. Rising level of unemployment has increased militancy among the youth and impacted negatively on public order (Triechel, 2010). In addition, this steady increase in GDP growth over time has not resulted in proportionate poverty reduction nor created necessary jobs for the active population. As a result, the youth have been reported to engage more in anti-social activities, such as armed robbery, kidnapping, political thuggery, pipeline vandalisation, civil unrest, and other forms of anti-social violence during the period (Triechel, 2010). Unemployment in 15-24 age group was 37.7 per cent, and 22.4 per cent in the 25-44 age bracket, further exposing the inequality in the job market (NBS, 2015).

Despite the recent change in the methodology of computing unemployment in Nigeria (Kale and Doguwa, 2015), which has tempered the estimated rate of unemployment, more current publications of the National Bureau of Statistics (NBS, 2015) indicated that the unemployment situation persists, if not escalating. The rate of unemployment, according to NBS (2015) by the end of the first quarter of 2015 was 7.5 %, and 8.2% by the end of the second quarter despite the growth performance of the recent years according to the record of the Bureau.

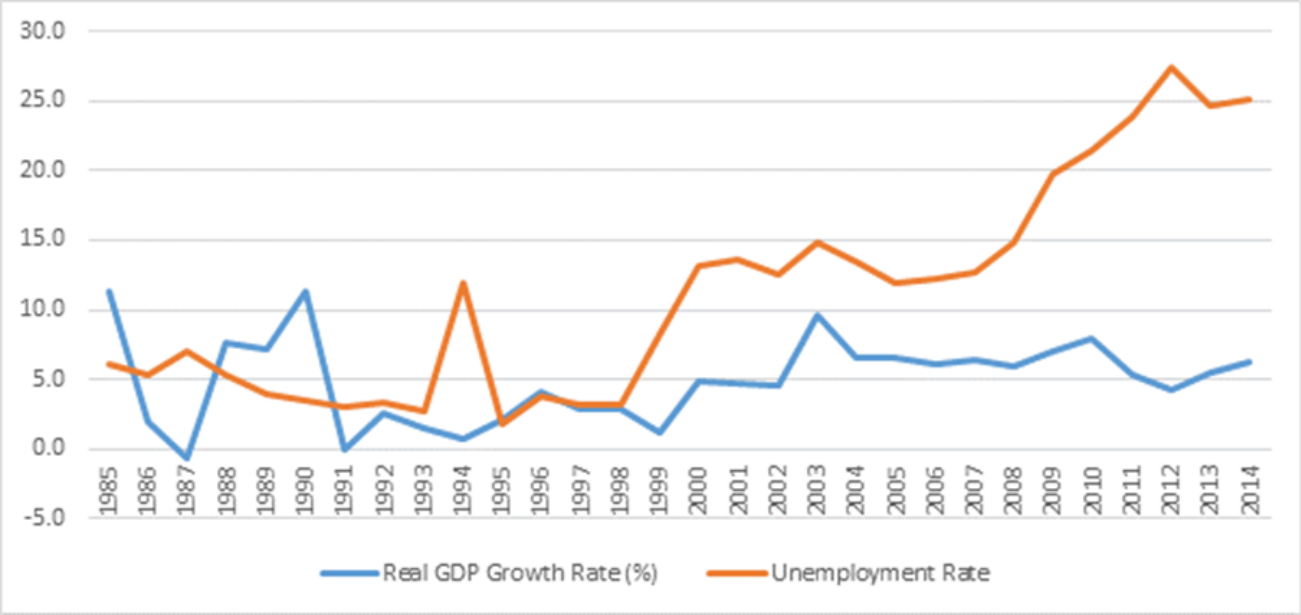

Figure 1: Rising Unemployment Co-existing with Economic Growth

Source: Author's analysis of data collected from the National Bureau of Statistics

According to the National Bureau of Statistics (2015), unemployment and underemployment were highest among the youth population, ages of 15-34. The unemployment rate by the second quarter of 2015 (Q2, 2015) was highest for the age cohort of 15 -24 at 14.9% (up from 13.7% in the first quarter of 2015 while the underemployment rate for the same group in the same period was 33.8% (up from 30.6% in the first quarter of 2015). For the labour force age cohort 25-34, unemployment rose to 8.9% in the second quarter of 2015 from 8.2% in the first quarter of 2015 and 6.9% in the fourth quarter of 2014, while underemployment for the same age group was at 19.5% from 17.7% in the first quarter of 2015, and 19.0% in the fourth quarter of 2014. Consequently, 48.7% of Nigerians in the labour force aged 15-24 were either unemployed or underemployed in the second quarter of 2015 compared to 44.3% in the first quarter of 2015, and additional 28.4% aged 25-34 were either unemployed or underemployed in the second quarter of 2015 compared to 25.9% in first quarter of 2015.

The unemployment statistics were also higher and unfavourable for women than men in the second quarter of 2015. While 9.6% of women between 15-65, willing, able and actively working or searching for work were unemployed, additional 21.6% of women in the same category were underemployed in the same quarter. On the other hand, 6.9% of their male counterpart were unemployed in the second quarter of 2015, and additional 15.4% of male were underemployed, according to NBS (2015).

The duality between urban and rural economies also manifested when NBS (2015) reported that underemployment is more of a rural phenomenon (22.1% rural underemployment compared to 7.4% rural unemployment) due to the nature of their jobs essentially as seasonal farmers, whereas, unemployment is more of a problem in urban centres (10.1% urban unemployment compared to 7.4% urban underemployment) because the educated youth migrate to seek paid employment found essentially in the cities.

According to Ajakaiye, Jerome, Nabena, and Alaba (2016), agriculture is the highest contributor to employment in Nigeria, accounting for more than 50% of employment. However, they reported an increasing marginal shift from the agricultural sector in both absolute and proportional figures. Although, overall employment in manufacturing, just as in agriculture, also fell significantly between 2005 and 2014, agriculture held on as the largest negative contributor to the change in employment rate in Nigeria between 2005 and 2014. During the period, only mining and services sectors had employment growth in absolute terms. Employment generation, however, contracted

in all sectors, except in the services sector, where GDP contribution also more than doubled (Ajakaiye, Jerome, Nabena, and Alaba, 2016).

Table 2: Labour Market Statistics (Q4, 2014 – Q2, 2015)

Labour Market Statistics.	Periods		
	2014-Q4	2015-Q1	2015-Q2
Employed (‘000)	66,951.2	67,902.5	67,947.1
Time – related underemployed (‘000)	13,052.2	12,208.8	13,571.1
Fully Employed (‘000).	53,899.0	55,693.7	54,376.0
Unemployed (‘000)	5,612.8	5,533.6	6,063.5
Not in Labour Force(‘000)	28,838.1	29,388.1	29,557.0
Labour Force Population(‘000)	72,931.6	73,436.1	74,010.6
Working Age Population(‘000)	101,769.7	102,824.2	103,567.6

Source: NBS (2015)

Employment generation is supposed to be an ordinary outcome of the economic growth process. However, despite the very impressive growth outcome experienced in Nigeria during the review period (1981-2014), unemployment persisted stubbornly and continued to rise (see Figure 1 and Table 2). Agriculture that used to provide the bulk of employment is losing jobs to the other sectors of the economy through structural shifts. Meanwhile, the rate of growth of jobs in these other sectors such as Mining, Manufacturing, Construction, Administration, Trade and Services, is not enough to absorb and not growing at the same rate as the continually growing labour force.

It is therefore important to examine the factors influencing sectoral employment, particularly, with regard to the agricultural and non-agricultural sectors and how those factors and their interconnections may be harnessed optimally into a framework for achieving aggregate employment commensurate with aggregate economic growth, that is, growth-employment targeting.

In the light of the above, this study attempts to address the following research questions:

(1) What is the pattern of unemployment during the period 1981 to 2014 when Nigeria experienced good aggregate growth performance?

(2) What is the employment intensity of aggregate growth during 1981 to 2014?

(3) Are some sectors of the economy more employment sensitive than others during the period?

(4) What factors drive employment during economic growth?

1.2. Objectives of the study

The main objective of the study is to determine the effect of the economic growth regime in Nigeria on agricultural and non-agricultural employment over the last three and a half decades (1981-2014). The specific objectives are to:

1 establish the pattern of unemployment in Nigeria during the period 1981 to 2014;

2 estimate the employment elasticity of aggregate growth in the economy during the period;

3. estimate the employment elasticity of sectoral output growth during the period; and,

4. determine the factors affecting employment across sectors during the period of growth with a view to developing a framework for growth-employment targeting.

1.3. Justification of the study

Economic growth is not an end in itself, but a means of job, value and wealth creation expected to lead to poverty alleviation and the general improvement of social welfare (Ravallion and Chen, 1997; Ravallion, 2001; Dollar and Kraay, 2002; Hull, 2009; Ajilore and Yinusa, 2011; and Mkhize, 2015).

This study will enable us to determine whether or not the fairly strong economic growth outcome in Nigeria was indeed 'jobless' or job intensive. The outcome will further enable policy makers to specify and monitor employment-growth targets (Iyoha, 1978; Sawtelle, 2007; Yogo. 2008; and Ajilore and Yinusa, 2011) necessary for a transition to a very job intensive economic growth regime.

Furthermore, an estimation of the employment elasticity of sectoral value added in the economy, which is proposed, will facilitate industry-specific initiatives that can assist employment growth and the much needed economic diversification in Nigeria.

There is also a methodological justification for the study, since previous investigations of the unemployment problem in Nigeria (such as in Njoku and Ihugba, 2011; Sodipo and Ogunrinola, 2011; Oloni, 2013; and Kareem, 2015) have focused principally on descriptive analyses. Where econometric analyses were used, none has employed the more robust Vector Error Correction Model (VECM) which best simulates the complexity of the economy, consisting of various sectors and variables working simultaneously to produce common economic outcomes measurable in statistical aggregates of growth and employment, among others.

In effect, the current study intends to fill in the gaps in the relevance of concept, research design and methodology. Specifically, this study will use more current [since employment elasticity is time-sensitive (Dopke, 2001)] time series data and employ the more robust econometric model of VECM to estimate aggregate elasticity of employment [not Okun's specification because of asymmetry (Dopke, 2001; and, Silvapulle, Moosa and Silvapulle, 2004)].

Sectoral elasticities will be useful in identifying the sectors of the economy where growth has more or less employment intensity / elasticity. This will allow policy makers to fashion out industry-specific initiatives to stimulate employment generation and create the much needed jobs. This is necessary at this time when we need to transit from "jobless growth" to employment intensive growth, and economic diversification.

In terms of contribution, this study is unique in that it applied the robust vector error correction model methodology to analyse the rebased time series economic data between 1981 and 2014, and utilised the results to build a new framework for Employment-Growth targeting.

1.4. Plan of the report

The rest of the report is in four chapters. Chapter two presents literature review; chapter three discusses the methodology of the study; chapter four presents and discusses the results; while chapter five summarises the major findings as well as presents the conclusions and recommendations, while highlighting the areas for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1: Theoretical framework

The national output of an economy is produced by combining the factors of production, including labour. The demand function for labour can be derived by assuming a constant elasticity of substitution (CES) production functional form and estimating the marginal productivity of labour (MPL) equation to obtain the input of labour in a Cobb-Douglass production functional form as follows (Mkhize, 2015):-

$$GVA_t = A \{\alpha K_t^{-\rho} + (1-\alpha) L_t^{-\rho}\}^{-\eta/-\rho} \quad (1)$$

where,

GVA_t = Gross Value Added (sectoral output)

K_t = Capital input

L_t = Labour input

A = Efficiency parameter; $A > 0$

η = Returns to scale parameter; $\eta > 0$

α = Distribution parameter; $0 < \alpha < 1$

ρ = Extent of substitution (between K and L) parameter, $\rho > -1$, and related to elasticity of substitution; $\sigma = 1 / 1+ \rho$

The derivative of labour (i.e. marginal product of labour (MP_L)) from Equation (1) can be written as:

$$dGVA_t / dL_t = \eta (1-\alpha) / A^{\rho/\eta} . GVA_t^{(1+\rho)/\eta} / L_t^{\rho+1} \quad (2)$$

The above MP_L equation is solved for the L_t variable in order to get the empirical labour (employment) demand function:

$$\eta\,(1-\alpha)\,/\,A^{\rho/\eta}\,.\,GVA_t^{(1+\rho)/\eta} = L_t^{\rho+1}$$

$$\left[\eta\,(1-\alpha)\,/\,A^{\rho/\eta}\,.\,GVA_t^{(1+\rho)/\eta}\right]^{1/\rho+1} = L_t$$

$$L_t = \left[\eta\,(1-\alpha)\,/\,A^{\rho/\eta}\,.\,GVA_t^{(1+\rho)/\eta}\right]^{1/\rho+1}$$

$$L_t = \left[\eta\,(1-\alpha)\,/\,A^{\rho/\eta}\right]^{1/\rho+1}\,.\,GVA_t^{(1+\rho/\eta)(1/\rho+1)}$$

$$L_t = \beta_0\,GVA_t^{\beta 1} \qquad (3)$$

where,

$$\beta_0 = \left[\eta\,(1-\alpha)\,/\,A^{\rho/\eta}\right]^{1/\rho+1}$$

$$\beta_1 = (1+\rho/\eta)(1/\rho+1)$$

$$\beta_1 = 1+\rho/\eta\,.\,\sigma$$

σ (elasticity of substitution) = $1/\rho+1$

However, if we log-transform Equation (3) above, we obtain the following employment function:

$$\ln L_t = \ln \beta_0 + \beta_1 \ln GVA_t$$

$$= \beta_0 + \beta_1 \ln GVA_t + \ldots \beta_n \ln X_{nt} + \varepsilon_t \qquad (4)$$

Robust as the neo-classical concept of aggregate production function may seem, it is a subject of criticisms by a group of scholars, particularly, in the so-called 'Cambridge Capital Theory Controversies' of the late 1960s and early 1970s (Felipe and McCombie, 2005). Two major issues were raised; viz:-

(a) The problem of comparability of units of measurement: the neo-classical aggregate production function is defined such that output has to be a value, rather than a physical, measure regardless of the unit of observation (Felipe and McCombie, 2001); and,

(b) The problem of aggregation. Walters (1963); Felipe and Fisher (2003); and, Felipe and McCombie (2005) opined that it does not make sense to sum inputs and outputs across industries (for example oil refinery and farming) and estimate a function that purports to represent technological parameters, such as the aggregate elasticity of substitution of this combined industry (Felipe and McCombie, 2005).

However, Solow (1966) came to the defence of the macroeconomic aggregate production function, even though he felt that it was not entirely justifiable (Felipe and McCombie, 2005). Solow (1966) submitted that "the aggregate production function is an 'illuminating parable', or a mere device for handling data, to be used so long as it gives good empirical results, and to be discarded as soon as it does not, or as soon as something better comes up" (Felipe and McCombie, 2005). Wan (1971) also supported Solow when he argued that the functional relationship between output (Q) capital (K) and labour (L) is an empirical law which is operationally meaningful, since it can be empirically tested (Felipe and McCombie, 2005). In further support, Cobb and Douglas (1928) and Douglas (1948) found that the aggregate production function gives a good statistical fit, with the estimated output elasticities close to the factor shares.

2.2 Methodological review

Several econometric and descriptive techniques were employed to determine the objectives of this study as were stated in the analysis of the objectives.

In investigating objective one, descriptive analysis was used. However, for estimating objectives two and three the elasticity of employment approach was employed.

Two methods have been employed in literature to calculate the employment elasticity of growth. The first is the arithmetic method of estimating employment elasticity with respect to output. By this method, employment intensity is estimated by dividing the proportional change in employment by the proportional change in output during a specified period, usually one year as follows:

$$\varepsilon = \frac{\left[\frac{L_t - L_{t-1}}{L_t}\right]}{\left[\frac{Q_t - Q_{t-1}}{Q_t}\right]} \qquad (5)$$

Where:

ε = Employment elasticity of output growth

L_t= Employment at period t

L_{t-1} = Employment at the period prior to period t

Q_t= Output at period t

Q_{t-1} = Output at period t-1

The numerator, is the proportional change in the aggregate or sectoral employment of labour, L, between two time periods t and t-1, and the denominator is the proportional change in aggregate output or sectoral gross value added in the same period.

The advantage of this approach is that it is very simple to estimate. However, it has some shortcomings. The first is that being a two-point estimation, the elasticity computed is not robust for the purpose of forecasting. The second defect is that the elasticity calculated may not present the technological relationship between labour and output for a sector or the state of technology in the economy, because the two years selected may not be representative. (Ajilore and Yunisa, 2011).

The second methodology is the econometric regression analysis, where a functional form assumed between employment and output is estimated. This is specifically advantageous for long and reliable time series data on employment and output. This method is more reliable because of its forecasting capability and the avoidance of the problem of finding representative base and terminal years. (Lim,1976).

Despite its relative usefulness, employment elasticity has its own shortcomings in that it may not perfectly explain the growth-employment nexus for some reasons. The first problem is that of reverse causality between employment and output. At the aggregate level, the combination of labour and other factors of production produces aggregate output. Consequently, the rate of growth of output is positive correlate of the rate of employment. All things being equal, the faster the growth of labour the faster the growth of output. By implication, employment intensity concentrates only on the demand side of the functional specification and does not consider the supply side, the output producing effect of the employment of labour. The second defect is that employment intensity holds only for a given state of technology. Thirdly, the concept of employment intensity is a function of the prevailing policy regime. A given policy regime could be more or less conducive to the growth of employment and could either be labour-intensive or capital-intensive (Islam and Nazara, 2000).

Obviously, the intensity of employment is not an explanatory variable. It is essentially endogenous and a consequence of many factors. It is a function of the natural forces of market economy and

the historical configurations of existing policies, the two effects of which are intertwine and difficult to disaggregate.

Another issue in estimating employment intensity is that concerning the assumption that economic growth will enhance employment growth while economic recession will cause unemployment. This is not necessarily the situation, as discovered by Islam and Nazara (2000) because of the "unemployment as luxury" hypothesis. The proposition is that if and when there are no unemployment benefits, unemployment during economic recession may become a luxury, such that people respond by re-allocating their services to the agricultural and the informal sectors rather than remaining "openly unemployed." When this happens, unemployment becomes a luxury that only those with adequate non-labour income can afford.

Furthermore, there is the criticism that aggregate employment intensity may not be able to compute the net effect of economic growth on sectoral employment.

However, two key considerations nullify the above criticisms and make employment intensity, as a concept robust enough to explain the nexus between economic growth and employment of labour. First, there exists a relatively stable relationship between aggregate employment and economic growth in the developed world useful in identifying growth thresholds at which employment generation becomes important. Second, employment intensity recognises the differences between a movement along a given employment-GDP growth curve and the shift of the curve.

Hence, at any point, the calculated employment intensity will measure the gradient of the curve. The gradient and intercept of the curve will also change based on the behaviour of the shift parameters, which in themselves are important dynamic factors like in technology and policy regimes. Since such shift variables cannot be readily captured and fed into the estimation of the intensity of employment, it is important to update the estimates on a regular basis. Such a procedure will also alert policy makers to any significant changes in the employment generating capacity of the economy and the need for policy action. Therefore, Islam and Nazara (2000) made of different time periods for computing employment intensity for the purpose illustrating this.

Furthermore, for disaggregating the influence of sectoral gross value added and total GDP on employment, Islam and Nazara, (2000) computed estimates that are sensitive to this distinction. They also prescribed the use of several methodologies and data sets from different sources to compute the estimates. This in itself will serve as a sensitivity analysis of the robustness of the of the methodology.

Consequently, this study shall employ the second method of regression analysis for the estimation of aggregate elasticity and sectoral elasticities of employment.

2.3 Empirical review

Dopke, (2001) reviewed past work and the empirical results on the employment elasticity of growth in selected developed countries and concluded that the nexus between unemployment and growth was still stable in the nineteen-nineties. However, the outcome of cross-country and panel studies suggest that the employment elasticity of output expansion is influenced by the country's wage setting mechanism, the share of the service sector, and labour market flexibility.

Oloni, (2013) investigated the effect the economic growth in Nigeria had on employment creation using Johansen Vector Error Correction Model. The findings revealed that, although economic growth had positive relationship with employment, the relationship was not significant.

Sodipe and Ogunrinola (2011) investigated the influence of economic growth on employment using time series data. Ordinary Least Square (OLS) regression model was employed to analyze the data. The result revealed that economic growth impacted positively and significantly on employment. However, a negative and significant relationship between aggregate employment growth rate and the Gross Domestic Product growth rate was observed.

The story is not too different elsewhere in Africa. According to Page, (2012), Africa has experienced fifteen years of consistent economic expansion. Income per capita for the region as a whole rose steadily, and regional growth exceeded the world mean. In the last decade, six of the globe's ten fastest growing economics were in Sub-Saharan Africa. However, this good growth performance has not given rise to strong growth of "good" jobs (that is, those paying higher wages and providing better working conditions) especially for young people.

He argued that Africa's unemployment malaise is symptomatic of its lack of structural change. Instead, since 1990, structural shift has been to the wrong direction, with labour moving from higher to lower productivity employment. This phenomenon is also now common in Nigeria, whereby farmers abandon their farms to engage in motor cycle (okada) transportation business.

As a result, he submitted that employment policies should not concentrate only on the supply side of the labour market. While labour market reforms and active market policies can help in tackling the employment issue, the most important achievement will most likely come from policies

designed to promote the growth sectors with high labour productivity from a strategy for structural change.

Following the computation and compilation of the current and future structure of employment in Sub-Sahara Africa (2005-2020) based on household survey estimates for 28 countries and an elasticity model that explored the relationship among aggregate employment, economic growth and demographic outcomes, Fox, Haines, Munoz and Thomas (2013), found that Agriculture continued to employ majority of the labour force, although labour is shifting gradually out of the sector. Sub-Sahara Africa's projected rapid labour force expansion, combined with a low baseline of private sector wage employment, implies that even if Sub-Sahara Arica attains another decade of strong economic growth performance, the share of labour force employed in private enterprises is not projected to rise substantially. Governments would, therefore, need to execute strategies to attract private enterprises that provide wage employment, but they also need to improve productivity in the traditional and informal sectors which are projected to continue to employ the largest proportion of the ever expanding labour force. The above agrees with the earlier conclusions reached by Page, (2012). What this suggests is that policy makers in Sub-Sahara Africa have to find creative ways to retain the pivotal role of Agriculture and its value chains in providing many and quality jobs.

In examining the effects of the recent outbreak of Ebola Virus on the economy of West Africa through the trade channel, Adegun, (2014) exposed the nexus between fall in GDP and unemployment which moved in the same direction. He opined that the Ebola virus has resulted in movement restrictions and high mortality rates. This has in turn, evolved into less trade across borders and inside countries. This manifests in lower income and reduced productivity of firms, household, and farmers, leading in turn to reduced private savings and government revenue. This further results in declined national savings, capital accumulation and investments, unemployment, and ultimately fall in GDP growth to complete the vicious cycle.

In Ghana, employment expansion trails economic growth due to high growth of low employment creating sectors against slow growth of economic sectors with high labour absorption capacity (Baah-Boateng, 2013). In a cross-sectional estimation of a probit regression which indicated a strong effect of demand factors on unemployment this indicates a weak employment creating effect of economic growth. He discovered higher vulnerability of youths and urban dwellers. Educational attainment and gender also explain unemployment in some cases, while reservation wage also have significant and rising influence on unemployment. He proffered three recommendations; namely: (a) policies that promote investment in agriculture and manufacturing which are associated with

higher employment intensity of output (b) targeted intervention for youth employment, including support for entrepreneurial training and start-up capital to attract young school leavers to become "creators" rather than "seekers" of job; and (c) a downward review of reservation wage expectation on the part of job seekers.

In Liberia, expectedly, growth slowed down considerably to an estimated 1.8 per cent in 2014 from 8.7%, in 2013 due to the advent of the Ebola virus malaise, which had severe impact on economic and social activities. Some of government short-term priorities were to support the Ebola-affected households in improving income and employment while it intends to improve the business-enabling environment to create employment in the longer term. On the supply side, educational reforms would be introduced to generate skilled work force.

In Cameroon unemployment is low in the strict sense of the term at 4.4%. In the broad sense, it is about 13%. This does not include underemployment put at about 75.8%. Furthermore, the informal sector is large and accounts for about 90% of the employed labour force. As a result, government made employment an important element of development policy. Government has included unemployment as one of the three strategic components of the Growth and Employment Strategy Paper (GESP), thus considering employment not only as a consequence of economic growth but also as a promoting factor of such growth. Consequently, government is tackling unemployment through three key approaches; namely: (i) increasing quality employment opportunities (ii) matching the demand to the supply of labour, and, (iii) improving the efficiency of the labour market (IMF, 2010).

In examining employment problems in East Africa, using Tanzania as a case study, Nangale, (2012) observed that the high (5-8%) GDP growth rates in Tanzania was not followed by expanded employment generation, particularly for the frequently disadvantaged group, such as the youth. As a consequence, there is unemployment and underemployment among the youth population. He concluded that increased economic growth, though necessary, is not a sufficient condition for increased employment creation, particularly for young people. He identified gaps in the performance of the labour market and in the implementation of the national employment policy. To tackle unemployment, he recommended the removal of the following labour market barriers: mismatch between job and skills; inadequate job matching; poor signaling, poor information systems; lack of tax cut incentives to employers; lack of access to capital and existence of financial and investment policies which are insensitive to solving the problem of unemployment.

In Kenya, Omolo, (2010) found that formal sector employment continued to lag behind economic expansion, whereas, the rate of employment growth in the informal sector, so called Jua Kali, has continued to outstrip economic growth rate. As at 2008, the Jua Kali sector accounted for 80.5% of employment, rising from only 20.6% in 1986. Between the two periods, Kenya economy grew at an average annual rate of 3.52 %, while the average rate of growth in formal sector employment was a low of 2.23% per annum, and the informal sector employment average growth was a high of 17.22% per annum. The data showed a transitioning of jobs from formal into informal sectors, moving from less than 25% of total jobs in the country in 1986 to slightly more than 80% of aggregate employment in 2008. The accelerated expansion in informal employment occurred when the Kenya labour market started to undergo formal sector employment losses initiated by liberalisation polices, and the implementation of government strategy towards the promotion of growth and development of the informal and Jua Kali sectors, among other factors.

Malunda, (2012) employed Shapley decomposition methodologies to investigate the employment elasticity of economic growth in Rwanda in order to advise government on which sectors of the economy have a higher potential to create productive off-farm employment that will drive a greater percentage of the population out of poverty. He found that the percentage of the work force engaged in the manufacturing sector expanded by an average of 4% per annum and that these lags behind job growth in other sectors of the economy like construction, commerce, and transport, whose employment growth were well above 6%. He advocated the empowerment of medium to large scale entrepreneurs by providing access to capital, particularly to the agro-processing industries in the rural districts. He further advocated investment in the utilities like power to support business.

According to Siphambe, (2007), Botswana has experienced good economic growth performance since independence in 1966. While formal employment grew almost in line with GDP until 1991, employment growth detached from output growth in the early 1990s. This divergence was found to have occurred during the introduction of a number of policy reforms intended to deregulate economy. From 1980 to 1991 the economy expanded at an average of 10.3% per annum but slowed down to 6.3% per annum between 1991 and 2005. However, the fall in employment rate was steeper from 9.1% to 2.2% in the respective periods. Consequently, despite the good growth regimes, Botswana still had high unemployment and a growing informal sector. This has been traced to the non-diversified mono-cultural economy, which rely almost exclusively on the extraction of diamond. Besides, the slowdown in employment growth also coincided with the

implementation of reforms (financial liberalisation and labour market deregulation) intended to liberalise the economy and reduce direct government involvement.

Ajilore and Yinusa (2011) reached similar conclusions as above on the Botswana economy when they investigated the employment elasticity of sectorial output growth. They used both simple elasticity and econometric-type methodologies to investigate empirical evidence on the impact of economic growth on sectoral employment in Botswana. They discovered the low labour absorptive capacity of the Botswana economy at the aggregate and at sectoral levels, suggesting that the growth performance in the country was job-insensitive. They prescribed a diamond-led economy which should diversify into sectors and activities that will employ more labour.

Temitope (2013) used the approach of causality of time series data when the order of integration of the series under investigation is different to examine the direction of causality between employment and economic growth in South Africa, using quarterly data from the first quarter of 2001 to the third quarter of 2012. He discovered that there was unilateral influence running from economic growth to employment. It was thus concluded that economic growth had a positive and significant influence on employment in South Africa over the period of study.

Soto, (2009) used a methodology of Co-integration Error Correction Model to decompose the effect of GDP growth, real wages, cost of capital and the real exchange rate on employment in Ecuador. The result show that a permanent expansion of 1% in GDP growth led to an increase in employment of about 2.3% and the demand for labour was negatively related to increase in minimum wages and the cost of imported intermediate factor.

In sum, from the above literature review, it is obvious that the relationship between economic growth and employment, and the responsiveness of the transmission mechanism between them are country and time specific, depending on many factors such as the structure of the economy, labour market efficiencies, the state of technology and its rate of change, among other factors. The above review, also, reveals that employment in most economies is a function of wage rate, interest rate, and inflation rate. Regarding the structure of the economy, there exists many dimensions. It is not limited to the economic sectors as classified by UNSTAT alone. It is also a function of the relative sizes and the rate of change of the formal and informal sectors - formality and informality. It is equally a function of the duality that exists between the rural and urban sectors; and of the relative sizes and the rate of transition between the production and services sectors of the economy. However, there seem to be no specific relationship established between economic growth and employment nexus in the agricultural and non-agricultural sectors.

2.4: Conceptual framework

2.4.1: The concept of economic growth

Economic growth usually manifests in an increase in a country's Gross Domestic Product (GDP). According to the National Bureau of Statistics (2014), Gross Domestic Product is the total monetary value of all the legitimate final goods and services produced by the country over a specific period, usually one year. Nigeria in 2014 rebased its GDP from 1990 to 2010. This new basis of national accounting resulted in an 89% increase in the estimated size of the economy. Consequently, Nigeria now has the largest economy in Africa, with an estimated nominal GDP of USD 510 billion, surpassing South Africa's USD 352 billion as at the year ended 2014. The exercise further showed that the Nigerian economy was actually more diversified than previously recorded. However, rebasing only provides up-to-date statistics (PriceWaterCoopers, 2015). It does not represent increase in productivity or increase in real output.

It is important that GDP is calculated accurately and up-to-date to enhance comparability among countries (PriceWaterCoopers, 2015). A recent comparison of the tax revenue-to-GDP of Nigeria to other countries, for example, supports GDP rebasing by Nigeria. According to PriceWaterCoopers (2015) the tax-to-GDP ratio compares the amount of tax collection to the nominal GDP. Generally, the ratio in poor countries is around half of what obtains in developed nations. The 2012 data stand at 44.6% for France; Sweden, 45.6%; UK, 39%; US, 27%; Tanzania, 12%; and, Burkina Faso, 11.5%. If we consider all the three tiers of government, Nigeria had about 14.6% and 7.8% before and after rebasing respectively (PriceWaterCoopers, 2015). Furthermore, accurate and current data will make planning, implementation, monitoring, and evaluation of programmes more robust and informed.

Economic growth is usually estimated in real or inflation adjusted terms, in order to remove the potential distortion ascribable to inflation on the prices of goods and services produced. Consequently, economic growth is the increase in the inflation adjusted market value of all legally recognised finished goods and services produced by an economy over time. It is measured as the percentage rate of increase in real GDP. One of the notable observations of the rebasing exercise in Nigeria is the fact that it has resulted in lower estimates of real GDP growth rates compared to previous estimates (NBS, 2014).

2.4.2: The concept and measurement of unemployment and underemployment rates

In Nigeria, according to NBS (2015), unemployment is an estimate of the number of people actively looking for job as a percentage of the labour force. The labour force population consists of all persons in the age bracket of 15-64 years. Consequently unemployment, includes persons in the age bracket of 15-64 who, in the period under reference, were available for work, actively seeking for work, but were without work.

An individual is considered as employed if he or she is engaged in the production of goods and services, thereby contributing to the GDP in a legitimate manner, which is a component of the National Accounts and receives any form of remuneration for the job. A person is unemployed if he or she did nothing at all or did something but not up to twenty hours a week. Underemployment, on the other hand, occurs if a person works less than forty hours, but work more than twenty hours, on the average a week and / or if he or she works forty hours but he or she is engaged in an activity that underutilises his or her skills, time, and educational qualifications. By implication, rural farmers farming only seasonally will be considered underemployed if they do nothing off-season. However, if they work in both dry and wet seasons, they will be considered involved in full employment, (NBS, 2015). This underscores the importance of irrigation and other farm management practices that guarantee all-year farming.

The internationally accepted definition of employment, underemployment, and unemployment does not consider the quantity / suitability of wages earned, or whether the person involved in a particular job or economic activity is looking for another job or unhappy with his current job. Rather, employment, underemployment, and unemployment are treated as a function of a person's involvement or otherwise in economic activity, even if that activity is aimed only at making ends meet. The suitability of wages is covered under other quality of living standard indicators, such as, poverty, and not in determining whether one is employed, underemployed, or unemployed, which is a function of economic engagement (NBS, 2015).

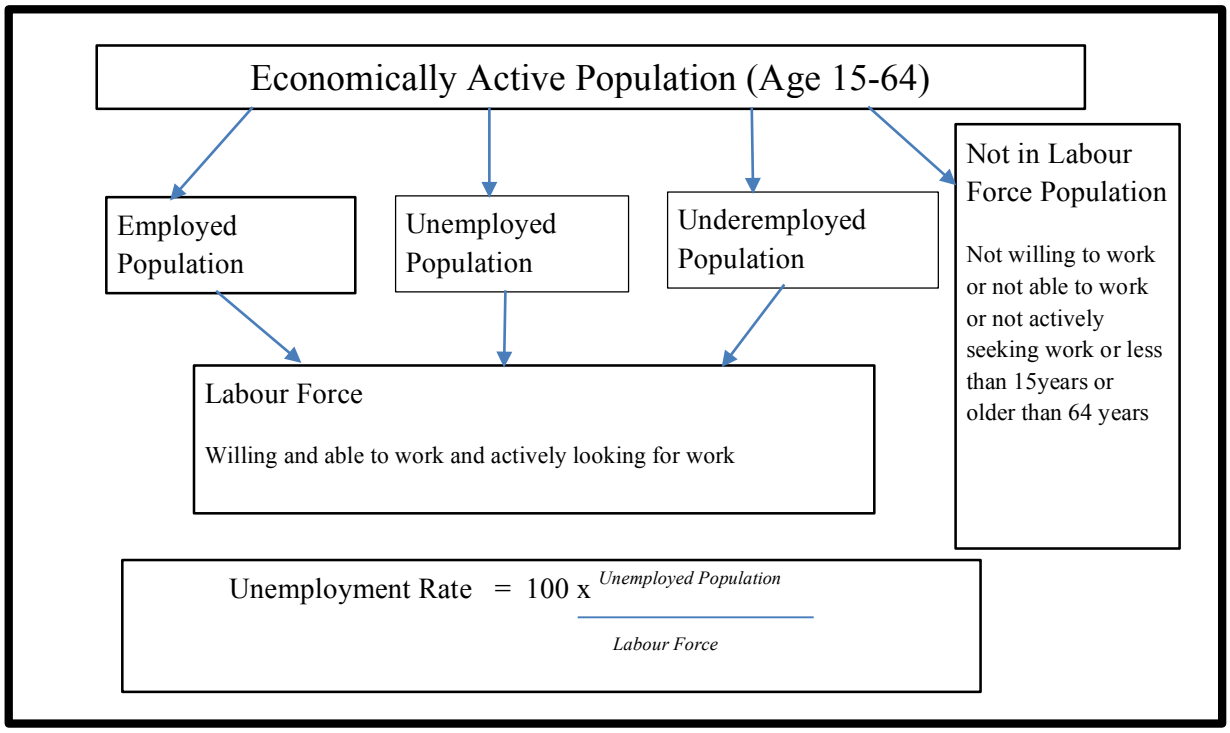

Figure 2: Computation of Unemployment Rate.

Source: NBS (2015, 2nd Quarter). Unemployment /Underemployment Watch

According to Ajilore and Yinusa (2011), the principal link through which the poor benefits from economic growth is in the amount of employment it creates. Economic growth is necessary, particularly as the population grows, to provide job for those seeking to work. In an economy with low or no job intensity of growth, unemployment remains stubbornly high even when the economy is growing. Therefore, a major interest of economic policy is to improve the employment generating capacity of growth. This was the reason why Revenga and Bentolila (1995) submitted that a determination of the sources of cross-country differences in the Okun relationship would be useful for macroeconomic policy. Consequently, over the years, researchers studied the relationship between economic growth and employment. Early studies by Okun (1962; 1970) defined the popular Okun's coefficient which measures the rate of change of real output for a given change in unemployment rate. Okun's law has its origin in Keynesian economics.

Okun's law has attracted tremendous attention from researchers for various reasons. First, it can be tested empirically (Jibril, Bappayaya, and Babayo, 2015). Second, it is important as a macroeconomic building block and also a useful proxy. For example, when combined with Phillips curve, it produces the aggregate supply curve (Prachowny, 1993). Thirdly Okun's law has applications in macroeconomic policy, especially, in determining the optimal or desirable growth rate, and as a prescription for reducing unemployment. Okun's coefficient is a useful "rule-of-thumb" in forecasting and policy making (Silverstone and Harris, 2001).

Baker and Schmitt (1999) estimated Okun coefficient for a panel of OECD countries and found that the employment intensity of growth today is higher than in the sixties. They stressed the importance of export growth as a determinant of domestic employment. They also concluded that the relatively good empirical performance of Okun equation implies that macroeconomic forces play a greater role in explaining unemployment than is generally believed.

Grounded as the Okun's law may appear, it is not without its own shortcomings. It has drawn the criticism of researchers, first from Okun (1970) himself, when he observed that his 1:3 relationship masked the effect of changes in other factors that accompany employment growth to foster economic growth. Okun's law had specified that an increase in the economic growth rate by 3% is expected to reduce the unemployment rate to 1%. point.

Another concern investigated in literature is the consistency of the Okun's law across time and space. According to Dopke (2001) the relationship between growth and employment may be altered with the passage of time due to changes in technology, changes in the institutional arrangements in the labour market and or changes in wage policies. Aside from inter-temporal

instability, the link between growth and employment may also vary across geographies. In this regard, according to Pini (1997), employment intensity in Germany and Japan ascended between 1979 and 1995 compared to 1960 -1979. In contrast it declined in Sweden and France, whereas it exhibited only little change in Italy, the UK and US. Pini (1997) also discovered negative employment intensity between 1990 and 1995 in Sweden and Italy. Furthermore, the relationship between output and unemployment is asymmetric contrary to the specification of Okun. Output expansion and contraction are accompanied by different changes in unemployment (Lee, 2000; Silverstone and Harris, 2001; Viren, 2001; Dopke, 2001; Cauresman, 2003; and Silvapulle, Moosa and Silvapulle; 2004).

On their own part, Khan (2001), Kapsos (2005), and Islam (2004) observed that employment intensity of growth has over emphasised employment growth over productivity growth. While employment growth emphasises the number of jobs created, productivity growth emphasises the qualitative aspect of growth in terms of the number of "decent jobs". Consequently, both the employment elasticity of growth and the productivity intensity of growth are needed to achieve economic development objectives, such as poverty targeting.

Furthermore, some researchers criticised Okun's law for neglecting, in its specification, the effect of relative prices (Flaig and Rottman, 2000); institutional factors (Revenga and Bentotila, 1995) and of exchange rate volatility (Buescher and Muller, 1999).

They found that the employment elasticity of growth is strongly related to real labour cost, exchange rate volatility and labour market institutions.

In Nigeria, employing the methodologies of Engle Granger co-integration test and Fully Modified OLS on 1980-2008 annual time series data, Bankole and Fatai (2013) discovered that Okun's law did not hold.

2.4.3: Concept of labour market

The structure and operations of the labour market in any economy is very important. The market determines vital economic outcomes of aggregate output and growth in the economy. Consequently, for good economic performance and social welfare, it is important that the labour market, like any other factor market, functions efficiently. Unfortunately, however, the operations of the labour market is influenced by many structural factors, institutional and regulatory, that limit its efficiency (Folawewo, 2015).

Institutional and regulatory arrangements in the labour market, such as trade unions, associations, bye-laws and judicial measures that govern hiring, firing, collective bargaining process, and other labour market activities have implications on efficiency of market functions of employment, wage determination, and productivity, among others. Furthermore, the nature and structure of the labour market, such as the extent of formality and informality affects its functioning and the effectiveness of its institutions (Sanchez-Puerta, 2010; Folawewo, 2015).

The desirability of labour market institutions and regulations, according to Folawewo (2015) is to manage market failure which often lead to inefficient allocation of resources. Consequently, the institutions and regulations help to ensure optimality and to protect workers. Unfortunately, contrary to their objectives, they often bring about unintended and undesired effects on labour market. In Nigeria, even though they have been set up in line with the standards of the International Labour Organisation (ILO) of which Nigeria is a member, labour market institutions and regulations are weak and often do not effectively serve the purposes for which they were established - the establishment and protection of workers' right, protection of the vulnerable workers, enforcement of minimum wage, compensation, and the provision of minimum working conditions (Folawewo, 2015).

The structure of the market itself has an important role to play on the employment status, household income and welfare. The labour market has several forms of income, including: cash income, and non-cash income. While these different forms of income contribute to the dimensions of inequality, income security has depended, to a large extent upon the cash income from the labour market (Ogwumike, Alaba, Alaba, Alayande, and Okojie, 2006). This suggests that access to employment and the remuneration attached to such labour market opportunity is important in inequality and welfare targeting in Nigeria.

The Nigerian labour market is dominated by self-employed persons, followed by wage and salary earners. According to Ogwumike, Alaba, Alaba, Alayande, and Okojie (2006), self-employed persons (farmers, traders and others) accounted for about 54.9% and wages and salaries (private and public) component for 38.7% of employed persons. Together, these two sectors of employment accounted for 93.6% of employment in the economy (See Table 3).

Table 3: Labour Market Structure in Nigeria According to National Manpower Board

Structure	Both Sexes %	Males %	Females %	Females as % of both sexes
Employer	4.3	5.3	2.7	25.1
Self Employed (Farmer)	6.5	7.0	5.7	34.4
Self Employed (Trader)	29.1	20.7	42.0	56.8
Self Employed (others)	19.3	22.4	14.4	29.4
Emp. Wages & Sal. (Private)	18.6	22.0	13.4	28.3
Emp. Wages & Sal. (Public)	20.1	20.3	20.0	39.0
Paid Apprentice	2.1	2.3	1.8	33.6
Total	100	100	100	39.3

Source: Ogwumike, Alaba, F., Alaba, O., Alayande, and Okojie (2006) P4.

From the above table, employers were accountable for only 4% of aggregate employment. Traders constituted the bulk of self-employed workers. They are responsible for 29.1% of aggregate employment. Other segments of the self-employed were responsible for about 19%. Farmers were responsible for only 6.5% of aggregate employment. The public and private sectors provided employment for 20.1% and 18.6%, respectively, of wage and salary earners. The paid apprentices were responsible for 2.1% of aggregate employment. Female employment was only very prominent among self-employed traders, where they constituted 57% of employment in the category. Their contributions in other areas were small and below those of their male counterparts. For example, they made up 39% of total workers in the public sector, particularly, in the wages and salaries category and 28.3% of the private enterprise employees. Their shares of employment were, respectively, 29.4% and 34.4% for other unspecified self-employed and self-employed farmers.

2.4.4: Impact Pathways:

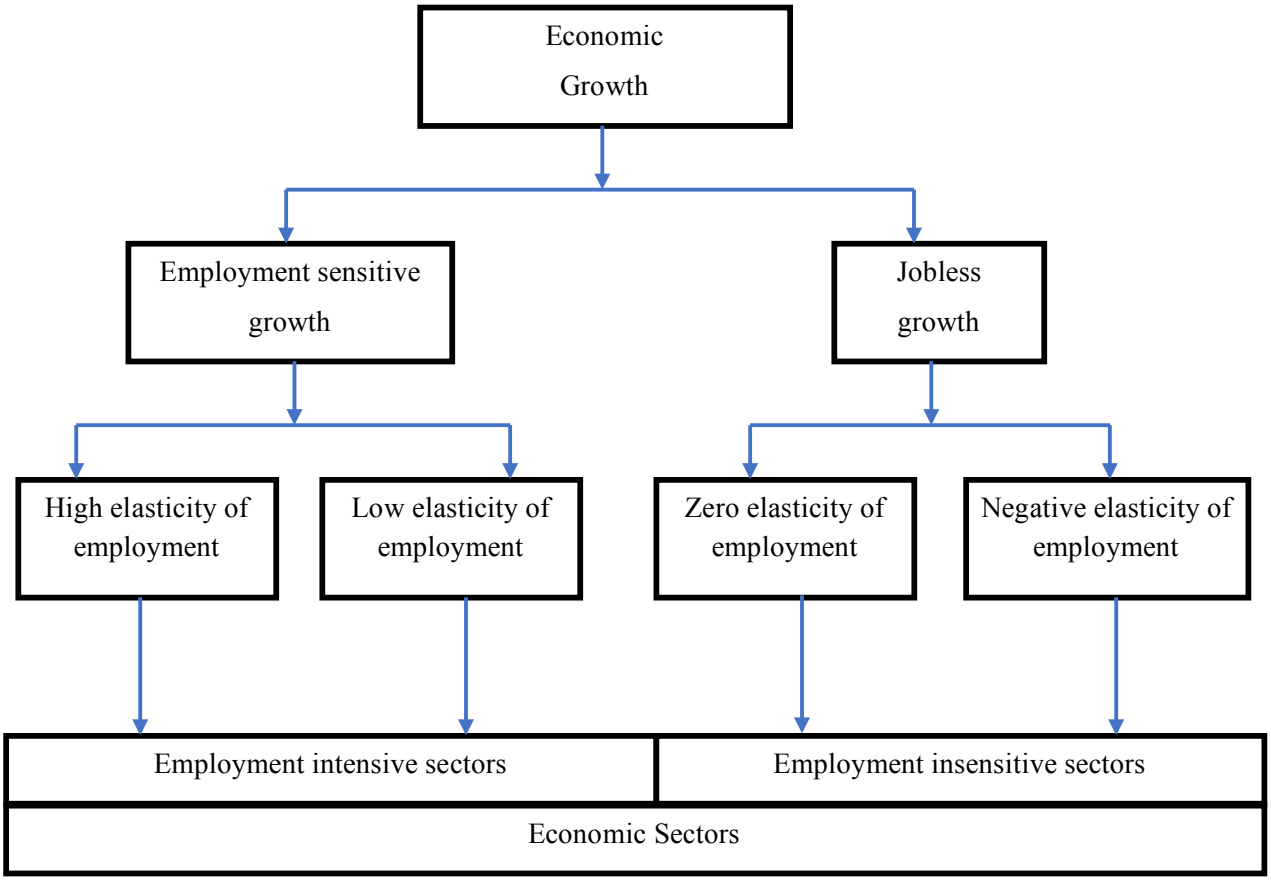

Figure 3: Impact Pathways.
Source: Author's Conceptualization.

2.4.5: Modelling the theory of change

Economic growth could either be employment intensive or "jobless." When it generates employment, the elasticity of employment could either be low or high. Naturally, not all sectors of the economy will produce employment intensive growth at the same rate. Furthermore, some other sectors will be employment insensitive outrightly. In some extreme cases, sectorial output growth could even come with job losses if the growth results from increased productivity occasioned by the substitution of labour-saving capital-intensive technologies for labour-intensive production processes.

Figure 3 represents the conceptualisation of the possible outcomes of the impact of growth on employment.

CHAPTER THREE

METHODOLOGY

3.1. Scope of the study

The impact of the economic growth regime in Nigeria between 1981 and 2014 on employment in agriculture and non-agriculture sectors of the economy at both aggregate and sectoral level, together with the pattern of unemployment were studied.

3.2. Sources and types of data

Time series secondary data covering 1981 to 2014 on the rebased Gross Domestic Product (GDP) and sectoral Gross Value Added (GVA) at 2010 constant basic prices, employment, wage rate, and inflation rate were collected from the National Bureau of Statistics (NBS). Similar data were collected on non-agriculture sectors of mining, manufacturing, trade and services, administration, and construction from the same sources. The variables were extracted, collated and summarised into a table of data (Appendix 3) from the following publications of NBS: Nigerian Gross Domestic Product Reports, Post GDP Rebasing Revision 1981-2014, and Annual Inflation Reports. The Minimum Wage series was generated from the Minimum Wage change history obtained from NBS. Interest rates data for the same period were collected from Central Bank of Nigeria's Annual Report and Statement of Accounts.

3.3. Method of data analysis

Both descriptive and inferential statistics were used to analyse the data.

3.3.1. Descriptive analysis

Descriptive statistics such as percentages, trend analysis, histograms, and comparative analysis were used to describe the trend and pattern of growth and employment / unemployment.

3.3.2. Regression analysis

The estimation methodology of elasticity of employment, was used to analyse objectives 2 and 3 – aggregate and sectoral elasticities of employment. Vector Error Correction Model (VECM) was used.

3.3.2.1: Model specification

In order to estimate the sectoral employment elasticities and the elasticities of employment with respect to wage rate, inflation and user cost of capital in the economy during the period under review, the double-log linear regression equation in chapter two, was extended as follows:

$$lnL_t = \beta_0 - \beta_1 lnW_t + \beta_2 lnr_t + \beta_3 lnGVA_t + \beta_4 ln\pi_t + T_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(6)$$

where, t = 1, …,n years. The dependent variable,L_t, represents aggregate employment (formal and informal, public and private) in thousands of persons in the specific economic sectors, in year t.

The main economic sectors in Nigeria considered for employment during the period under review are (NBS, 2015):

EMP_AGRI= Employment in the Agriculture sector in year t.

EMP_MIN&QUA= Employment in the Mining and Quarrying sector in year t.

EMP_MAN= Employment in the Manufacturing sector in year t.

EMP_CONST = Employment in the Construction sector in year t.

EMP_ADM&SOC = Employment in the Administration and Social Services sector in year t.

EMP_TRA&SER= Employment in Trade and Services sector in year t.

The exogenous variables are:

W_t = minimum wage rate in time t, measured in thousand Naira.

r_t = is the user cost of capital in time t, represented by the weighted average prime lending rate in the economy.

π_t = inflation rate in time t.

GVA_t = sector specific GVA in constant 2010 basic prices.

Similarly, the major economic sectors considered for GVA in Nigeria during the period under review are:

GVA_AGRI= Gross Value Added in the Agriculture sector in year t.

GVA_MIN&QUA = Gross Value Added in the Mining and Quarrying sector in year t.

GVA_MAN= Gross Value Added in the Manufacturing sector in year t.

GVA_CONST = Gross Value Added in the Construction sector in year t.

GVA_ADM&SOC= Gross Value Added in the Administration and Social Services sector in year t.

GVA_TRA&SER= Gross Value Added in Trade and Services sector in year t.

TIME (T_t) = yearly time trend variable, where t = 1 is year ended December, 1981 and

t = 34 is year ended December, 2014.

ε_t = error term.

The function analysed in this study is as follows:

$$L_t = f\left(W_t, r_t, \pi_t GVA\_AGRI_t, GVA\_MINING_t, GVA\_MAN_t, GVA\_CONST_t, GVA\_ADMIN_t GVA\_TRASERV_t\right) \quad \ldots\ldots\ldots 7$$

From the model, the equations to analyse are:-

1) AGG_ EMP = f(GDPt, W_t, r_t, π_t)……(8)

2) EMP_AGRIC =f(GVA_$\mathrm{AGRI_t}$, W_t, r_t, π_t)……...(9)

3) EMP_MIN&QUA =f(GVA_MIN&QUAt, W_t, r_t, π_t)…… ……(10)

4) EMP_MANU =f($\mathrm{GVA\_MANU_t}$, W_t, r_t, π_t)…… ……...(11)

5) EMP_CONST =f($\mathrm{GVA\_CONST}_t$, W_t, r_t, π_t)…… ……(12)

6) EMP_ADM&SOC =f(GVA_ADMSOC_t, W_t, r_t, π_t)…… …… (13)

7) EMP_TRA&SER=f(GVA_TRASER_t, W_t, r_t, π_t)…… ……..(14)

Where:

$W_t = \mathrm{MinimumWageRateinyeart}$

$r_t = \mathrm{WAPLRinyeart}$

$\pi_t = \mathrm{inflationrateinyeart}$

The above model postulates that employment of persons will vary with macroeconomic variables, and that employment decisions by economic units are a function of previous year's information.

3.3.2.2. Description of the variables

Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is the value of all the final goods and services produced by a country over a specified period, usually one year (NBS, 2014). Gross Value Added (GVA) is the value of goods and services produced in a sector. It is the output of the sector less intermediate consumption in that sector. In this study, these variables were obtained from the Nigerian National Bureau of Statistics (NBS). Yearly GDP and GVA series at 2010 constant basic prices were collected from NBS for the period 1981 to 2014. The series, which were in billions of Naira, were produced after the GDP rebasing exercise of 2014 which used 2010 as the base year and covered the 46 (up from 33) reclassified economic activity sub-sectors of the Nigerian economy.

Time trend

In time series analysis, time is a variable as the other variables and the relationships among them changes or stabilises over time. Apart from capturing the trajectory of change in the endogenous variables, and the effect of technological change, which are not captured directly, time trend takes care of of some specification errors in the regression equations (Cooley and Prescott, 1973). The lagging approach employed in the analysis took care of the time trend in determining /explaining employment level in the economy.

Wages

Wage series were not available from the National Bureau of Statistics and other relevant organisations. Furthermore, NBS has not produced the re-based GDP using expenditure approach as of the time of this study. The latter would have been decomposed to obtain the wage component.

Although there are various concepts of wages, I adopted the minimum wage in the economy for the following reasons which outweigh its limited variability since it does not change annually: It is more relevant to policy making; more determinable with exactitude; better known to everybody; more relevant to the economic strata where employment expansion is most desired, and more relevant in determining the minimum financial welfare in the economy. According to ILO (1970) the minimum wage represents the amount of compensation that an employer is required to pay wage earners for the work performed during a giving period, which cannot be reduced by collective agreement or by an individual contract. Minimum wage is, therefore, the lowest compensation that employers may legitimately pay to workers. This implies that it is the price floor below which a worker may not legally sell his labour services.

Furthermore, recent debates among the three tiers of Government in Nigeria, the Labour Union, the Legislators, Non-Governmental Organisations, and Social Commentators on minimum wage did not only support this choice but seems to have heavy impact on the ethnic - or geo - political organisation, reorganisation and/or viability of the federating units of Nigeria (Eme and Ugwu, 2011; Ajimotokan and Obi, 2016; Buhari, 2016). It is more relevant in employment decision making particularly in the government sector that is very wage elastic, but expected to be employment intensive. For example, according to the Senate of the Federal Republic of Nigeria in its plenary of July 21, 2016, '27 states of the federation can no longer pay the salary of their workers.'

Other wage concepts are: average wages in the public sector, average wages in the private sector, average wages in the junior staff category and average salaries and emoluments of senior staff categories both in the public and private sectors (NECA, 2003). For this study, minimum wage change history was obtained from NBS and from this; the minimum wage series was generated.

Interest rate

There are various concepts of the user cost of capital (Ajilore and Yinusa, 2011 Mkhize, 2015).

We opted to work with the Weighted Average Prime Lending Rate (WAPLR) of banks operating in the economy during the period, because of more relevance considering that it affects every economic borrowing decision in the economy. It is subject to regular (weekly) professional determination and reviews at the Assets and Liability Management Committees (ALCOs) of all the banks operating in the economy. Besides, the determination of WAPLR also bears reference to the weighted average cost of generating loanable funds by lenders in the economy. Long-term lending, available only to prime bank customers, is consummated at around the Prime Lending Rate (CBN, 2015).

Unemployment Rate

Unemployment is an estimate of the number of people actively looking for job as a percentage of the labour force. The labour force population consists of all persons in the age bracket of 15-64 years. Consequently, unemployment includes persons in the age bracket of 15-64 who, in the period under reference, were available for work, actively seeking for work, but were without work (NBS, 2015). The data of unemployment rate was collected at the National Bureau of Statistics (NBS).

Inflation Rates

Inflation rate is a weighted measure of average price changes in the Nigerian Economy. It is proxied by the Consumer Price Index (CPI) by the National Bureau of Statistics. CPI is currently indexed to the base period of December 2009 = 100. The CPI measures the average change, over time, in prices of goods and services consumed by people for day-to-day living. Weighting is done to capture the relative importance of the selected market basket of goods and services, in various sectors of the economy, regularly priced (NBS, 2019).

Annual Inflation Rates data were also collected from the National Bureau of Statistics.

3.3.2.3. Unit root test

Time series data are most useful when they do not contain noise or unit root problems. However, frequently associated with time series data is the problem of noise. Consequently, it is necessary to test for and remove unit roots when and if they exist in any series. If they do, the noise must first be removed before proceeding with analysis in other that the results are not spurious, in other words, so that we can rely on the results for interpretation.

When there is no unit root or the noise has been removed, the series is said to be stationary. Several tests of stationarity have been developed to examine whether a series is stationary or non-stationary. If the series under analysis is stationary at level, this implies that the series contains no noise. Therefore, the series is said to be I(0). However, if the series being analysed is non-stationary in its level form, but stationary in the first difference form, then, it is said to be integrated of order 1 or I(1). Most time series can be classified as being integrated of order d, I(d). This means that the series must be differenced d times to become stationary. The most common test of the stationarity of a time series is the Augmented Dickey-Fuller (ADF) test proposed by Engle and Granger in 1987 as follows:

$$\Delta \boldsymbol{Y_t} = \boldsymbol{\beta_1} + \boldsymbol{\beta_2}_t + \boldsymbol{\delta Y}_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad \text{...} (15)$$

where Y_t is the relevant time series, t is time trend, ε_t a white noise error term; where

$$\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2}),\ \Delta Y_{t-2} = (Y_{t-2} - Y_{t-3}) \quad \text{...} (16)$$

The hypothesis of the ADF test will be specified as follows:

Null hypothesis: Ho: $\beta = 0$

Alternative hypothesis: H_1: $\beta < 0$

If the null hypothesis is not rejected, then the series is non-stationary, but if it is rejected, it means the series is stationary or I(0). A time series is stationary when the process by which the data is generated is the same over time. That is, the series' mean, variance and covariance with lagged values of itself should not change with time. (Hansen and King, 1996; Mkhize, 2015). According

to Mkhize, (2015) ADF test tends to over-reject the null hypothesis when using too few lags and to reduce the degrees of freedom when there are too many lags. Song and Witt (2000) in their study of tourism demand modelling and forecasting, justified the importance of appropriate lag length for time series data. In determining the appropriate lag length for the ADF test in the study, Schwarz Information Criterion was used.

3.3.2.4. Co-integration test

According to Stock and Watson (2017) when variables individually non-stationary are co-integrated, two (or more) variables may have common underlying stochastic trends along which they move together on a non-stationary path. For simple instances of few variables and one co-integrating relationship, an error-correction model (ECM) is the appropriate econometric specification. In this model, the equation is differenced and an error-correction term estimating the previous period's (t-1) deviation from long-run equilibrium is included.

The most common tests to investigate the number of common trends among the series in a VAR/VEC were developed and proposed by Johansen (1995). The approach is very similar to testing for unit roots in the polynomial representing an Auto Regression (AR) process. If we have n I (1) variables that are modelled jointly in a dynamic system, there can be up to n – 1 co-integrating relationships linking them. Stock and Watson (2017) thought of each co-integrating relationship as a common trend interconnecting some or all the series in the system. The co-integrating rank of the system is the number of such common trends, or the number of co-integrating relationships[1].

To select the co-integrating rank r, a sequence of tests was performed. First, the null hypothesis of $r = 0$ against $r \geq 1$ to investigate if there is at least one co-integrating relationship was tested. If and when $r = 0$ is not rejected, then it was concluded that there were no common trends among the series, in which case, a VEC model is not needed. VAR is then simply used in the differences of the series.

If $r = 0$ is rejected at the initial stage, then at least some of the series are co-integrated. Then, the number of co-integrating relationships is determined. The second step is to test the null hypothesis

[1] The term "rank" refers to the rank of a matrix characterising the dynamic system. If a dynamic system of n variables has r co-integrating relationships, then the rank of the matrix is n – r. This means that the matrix has r Engel values that are zero and n – r that are not. The Johansen tests are based on determining the number of nonzero eigenvalues.

that $r \leq 1$ against $r \geq 2$. If the hypothesis of no more than one common trend is not rejected, then we estimate a VEC system with one co-integrating relationship.

If the hypothesis that $r \leq 1$ is rejected, then the hypothesis $r \leq 2$ against $r \geq 3$ is tested, and so on. r is chosen to be the smallest value at which the null hypothesis that there are no additional co-integrating relationships is not rejected.

Johansen proposed many relevant tests that can be employed at each stage. The most common is the trace statistic, which was used in this study. The Stata command vecrank prints the trace statistic or, alternatively, the maximum-eigenvalue statistic.

3.3.2.5. **Vector error correction model**

Vector error correction model (VECM) is the regression that takes into consideration the correction of the noise/unit root in the model as well as estimating the part of the noise that is being removed at each short run. (Stock and Watson, 2017). The software used for the regression analysis was Stata version 14.

3.4 *A priori* expectations

The signs expected for the coefficients in the model are as follows:

W_t : negative. If and when the percentage change in nominal wages increases, it reduces employers effective demand for labour, given a constant budget constraint and vice-versa. (Dokpe 2001; Soto 2009; Baah-Boateng, 2013).

r_t : positive or negative. If the interest rate increases, the demand by employers for capital decreases and the demand for consumer goods and services also decreases. The reduced demand for capital (that would become relatively more expensive) will reduce labour productivity and the depressed demand for consumer goods and services will decrease the derived demand for labour, vice versa. In these situations, employment would move in opposite directions to long term interest rates. However, in some industries capital may be a substitute for labour. In that wise, an increase in long term interest rates may depress the demand for capital and enhance the demand for labour, the substitute, vice versa. Consequently, long term interest rates would be a positive correlate of employment. (Malunda, 2012; Nangale, 2012; Baah-Boateng, 2013; and, Mkhize, 2015).

π_t: positive or negative. The effect of inflation rate is expected to either be positive or negative. When and if the rate of inflation increases, the marginal revenue products of labour increases. As a consequence, there is an increase in the demand for labour by employers. On the other hand, an increase in inflation rate may reduce consumer demand for goods and services, thereby depressing the derived demand for labour as a factor of production. (Mkhize, 2015).

GVA_t: positive. The growth of sectoral real GVA will lead to expanded derived demand for labour because employers will view real sector output growth as an indication of future expansion in demand for consumer final goods and services (Soto, 2009; Sodipe and Ogunrinola, 2011; Temitope, 2013; and, Mkhize, 2015).

In order to make model very useful for the analysis, equation (3) is log-linearised. The logarithmic functional form ensures that β_i can be interpreted as elasticities (Koop, 2005 and Felipe and McCombie, 2015), where β_2 is the elasticity of employment with respect to user cost of capital, while holding all other things constant ceteris paribus. In the same manner, also β_3 is the elasticity of employment with respect to output. It estimates the proportional change in the number of labour employed for a proportional change in sectoral GVA, holding other factors constant, ceteris paribus. Consequently, a positive elasticity coefficient of 0.25, for example, indicates that a percentage increase in GVA is associated with a quarter of a percentage increase in the number of people employed. The employment elasticity coefficients that will be calculated from equation (5) above imply that employment is a direct correlate of output (Soto, 2009; Sodipe and Ogunrinola, 2011; and, Temitope, 2013). Consequently, the elasticity coefficients estimated for individual economic sectors are suggestive of the correlation between the number of persons employed and gross value added.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents and discusses the results of the empirical analysis carried out on the data collected from the sources earlier mentioned in Chapter 3. These are arranged below according to the order of the objectives of the study previously itemized in chapter 1.

4.1. **The trend and pattern of unemployment in Nigeria between 1981 and 2014.**

During the period under review, unemployment rate was on the ascendancy in Nigeria. After a slow rate of increase between 1981 and 1987, unemployment rate declined steadily between 1987 and 1993. This was followed by a spike in 1994, which rapidly declined to an all-time low in 1995. It is observed that the unemployment spike coincides with the economic slowdown associated with the June 12 political crises of 1993/1994. However, the rate of unemployment has continued to rise steadily ever since then, recording a hump between 1998 and 2005, and a steeper hump between 2007 and 2013 (Figure 4).

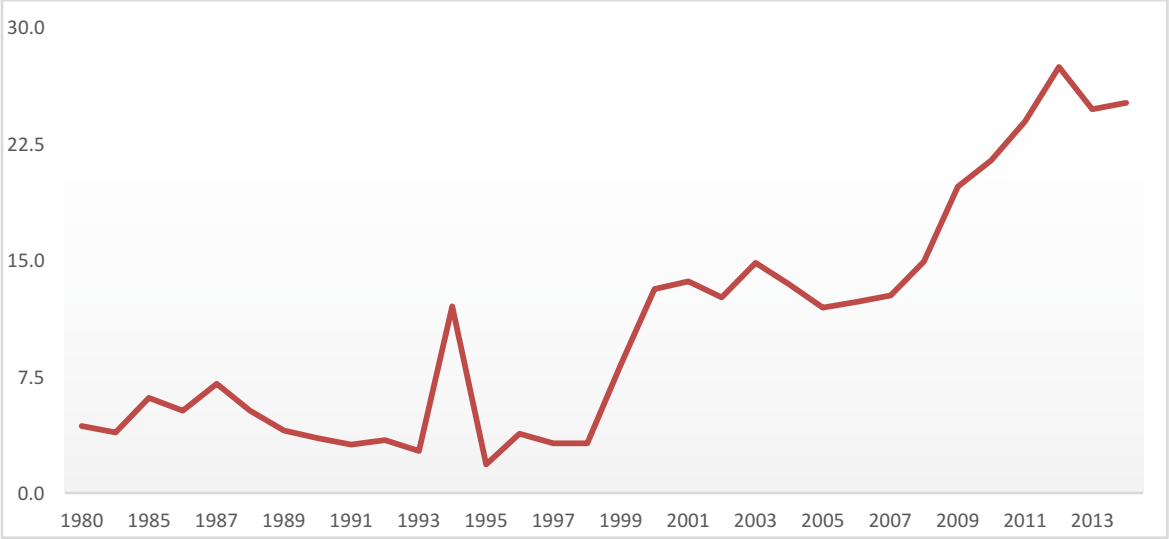

Figure 4: Unemployment Trend in Nigeria (1981-2014)
Source: Author's Analysis of Data collected from the National Bureau of Statistics

Comparing the unemployment trend with that of inflation, it shows that the two series exhibit the inverse relationship as shown in the Phillip's curve (Phillip, 1958) in Figure 5. While the level of inflation grew sharply between 1985 and 1995, the unemployment rate relatively decreased during the period. The inverse of this situation happened after 1995. As the level of inflation decreased, the level of unemployment increased.

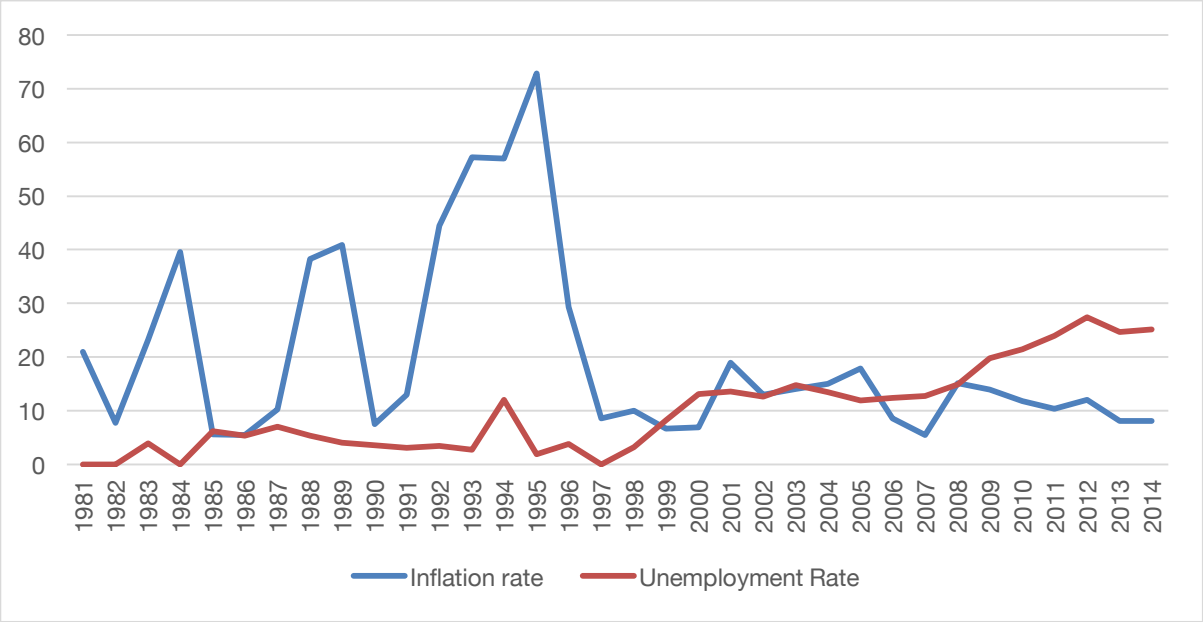

Figure 5: Unemployment and inflation trend in Nigeria (1981-2014)
Source: Author's Analysis of Data collected from the National Bureau of Statistics.

Figure 5 shows that the average unemployment increased continuously across decades. The rate between 1981 and 1990 was 4.9 per cent; 5.5 per cent between 1991 and 2000; 14.7 per cent between 2001 and 2010; and, 25.3 per cent between 2011 and 2014 (Figure 5). The picture of increases in the rate of unemployment becomes even clearer when broken into decades before and decades after structural adjustment programs (SAP) (Figure 6 and 7). The pre-SAP era was characterised by a relative high level of unemployment compared to that of inflation. However, in the post-SAP period, the gap between the two series reduced considerably and the two indicators namely unemployment and inflation were almost at the same level. This suggests that SAP contributed in increasing both the level of inflation and the level of unemployment.

As can be observed from the pattern of unemployment during the period under review, the period under military administration had lower unemployment rates than that under civilian administration contrary to expectations in socio-political discourse where civilian democracies are preferred to manage the economy for better outcomes (Figure 8). It, therefore, presents an opportunity for further research to unravel the distinctive causes of this aberration.

Available literature on the appraisal of the Structural Adjustment Program (SAP), such as Tackie and Abhulimen, 2002; NCEMA (a & b), 2004; Nwagbara, 2011; Ogbonna, 2012; and, Ogbimi, 2016 have focused on only the cardinal objectives of exchange rate stabilisation, minimum acceptable inflation rate, substantial reduction in import demand index, non-oil export promotion, reducing the dominance of unproductive investments in the public sector; and the implementation issues. Little attention has been paid to the employment or unemployment impact of Structural Adjustment Programme (SAP). The program was designed to redirect resources to the priority sectors of the economy, discourage import and encourage non-oil export. The programme also consisted of the liberalisation of the economy, commercialisation and privatisation of public enterprises. The program, which was introduced by the General Ibrahim Babangida administration on July 1, 1986 and originally meant for only two years (July 1, 1986 to June 30, 1988) actually stretched through the successive military regimes and became a key component of the Obasanjo administration from 1999 to 2007 (NCEMA, 2004).

The following complementary policies and programs were also introduced to ameliorate the painful effects of SAP:

a) Establishment of the Directorate of Food Roads and Rural Infrastructure (DFRRI) in 1986 to promote inclusive, sustainable, and integrated rural development.

b) Establishment of the National Directorate of Employment (NDE) to address the problems of mass unemployment, youth unemployment, vocational and skills development, small scale industries, special public works, graduate and non-graduate agricultural programs.

c) The Better Life for Rural Women Program and its successor in Family Economic Advancement Program (FEAP).

d) The Reflationary Budget of 1988.

e) Implementation of inclusive credit access programs, such as the establishment, in 1989, of People's Bank, the liberalisation of banking license in 1988, and the establishment of Community Banks in 1990.

f) Special SAP Relief Package - an extra budgetary package introduced in 1989 to provide, among other things, employment opportunities, improved healthcare and to reduce transportation problems, and many more. (NCEMA, 2004).

Although, according to Ogbonna (2012) SAP failed to achieve the cardinal objectives of exchange rate stability, minimum acceptable inflation rate, substantial reduction in import demand index, and non-oil export promotion, we may, however, have to assess the impact of the structural adjustment program in subduing unemployment (or in generating employment) during this period in another research.

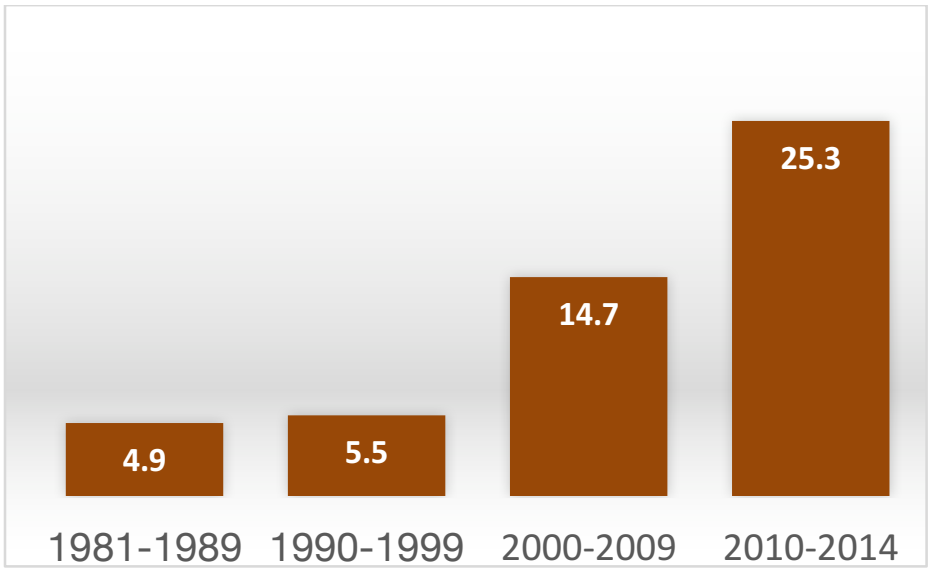

Figure 6: Unemployment Rate Over Decades
Source: Author's Analysis of Data collected from the National Bureau of Statistics.

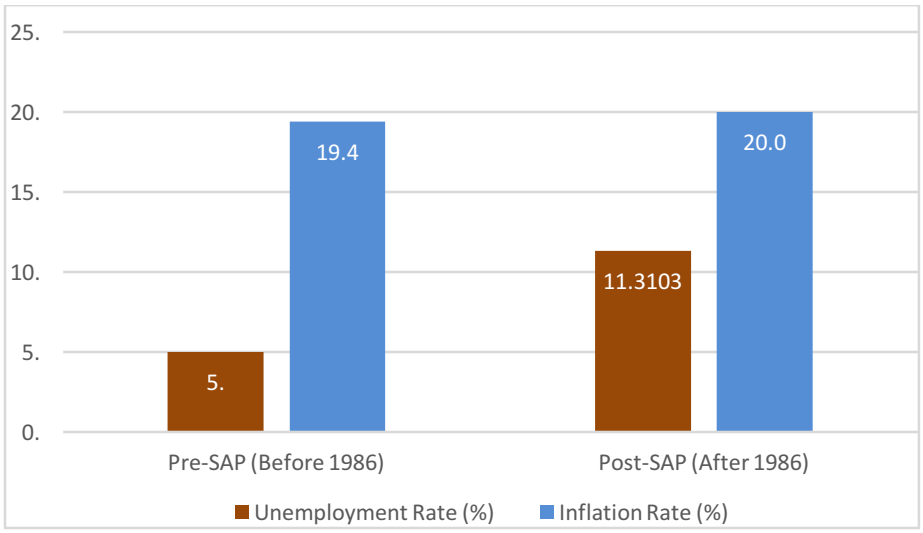

Figure 7: Unemployment and Inflation Rates in Pre-SAP and Post-SAP Periods.
Source: Author's Analysis of Data Collected from the National Bureau of Statistics.

Viewed differently, by comparing these two series between the democratic and military regimes in Nigeria during the period, we observed an inverse pattern. During the military regimes, the level of unemployment was relatively low while the democratic regime was characterised by relatively low inflation rate. The average unemployment rate was 4.6 per cent during the military regimes of 1984-1998, which was better than the rate of 16.9 per cent during the democratic dispensation between 1999 and 2014 (Figure 8).

It is important that we begin to document the performance of our political leaders and their regimes in the management of the economy in an unbiased manner in the academic environment. This will, hopefully, encourage them to perform well in economic management. Furthermore, it will make them avail themselves of the abundant specialist and other academic resources available in our Universities, as is done in the advanced economies in Europe and America. In the latter climes, the stylised facts of economic management documented by their advisors are what we study in advanced Macroeconomics today.

One plausible reason for a better employment performance under the military regimes was that they made more use of renowned academics. For example, the General Babangida regime was renowned to have made use of the most academic professors in the history of Nigeria. The military regimes made use of renowned Economists and Agricultural Economists like Professors Ojetunji Aboyade, Samuel Aluko, and Francis Idachaba, among many others. These specialists were selected on the basis of their expertise, whereas, the democratic regimes made use of fewer academic, who were often selected based on political considerations.

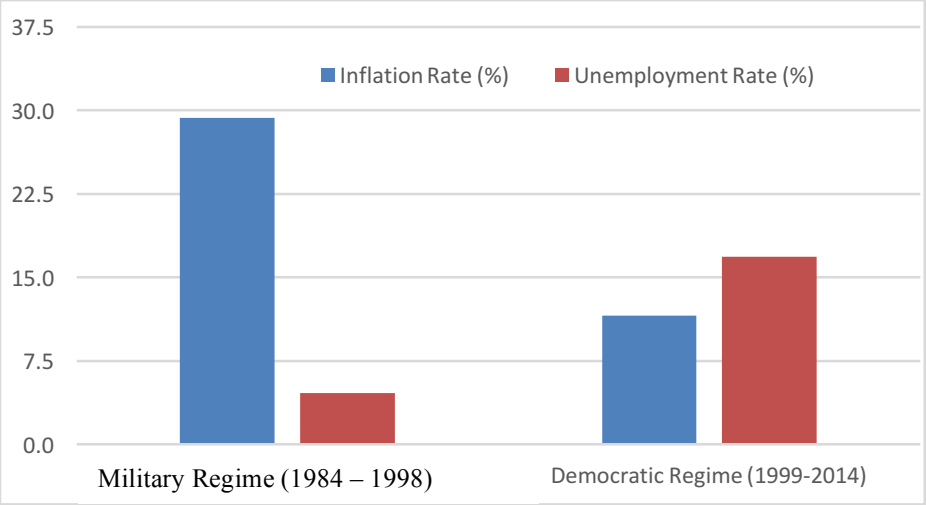

Figure 8: Unemployment and Inflation Rates in Military and Democratic Regimes.
Source: Author's Analysis of Data Collected from the National Bureau of Statistics.

To further understand the fluctuation in unemployment, we disaggregated the democratic regime into two, namely: the Obasanjo era, covering the period 1999 to 2007 and the Yar' Adua/Jonathan era, covering the period 2007 to 2014. Figure 9 shows that while the second democratic regime maintained the level of inflation, it however did not prevent unemployment from worsening, deteriorating from about 12% to as higher as 22%.

The better employment situation during Obasanjo's regime when compared with the Yar'Adua/Jonathan administration may be due to better growth performance during the former, particularly between 2003 and 2007, and the very high rate of change in growth. By the time Obasanjo took over in 1999 economic growth was 1.19 per cent, but by 2003, growth was approaching double digit at 9.57 per cent.

The reason adduced for better growth outcome during Obasanjo's regime when compared with Yar'Adua/Jonathan's is better economic management (Soludo, 2015). Some of the major economic management tools used by the Obasonjo's regime were seemingly more effective, and they include: privatisation, liberalisation and commercialisation. The privatisation of NITEL and the liberalisation of the telecom industry generated a lot of growth and employment. Furthermore, the introduction by the Obasanjo's administration of the Pension Reforms Act of 2004 and the new pension scheme has enhanced labour mobility and employment generation as workers can now transfer their services across Nigeria from areas of labour surpluses to areas of deficits without the fear of the possibility of losing their pensions (Odia and Okoye, 2012).

In contrast, the Yar'Adua/Jonathan administration reversed the privatisation of the refineries done by the Obasanjo administration, among others, thereby sending wrong signals to investors. This denied Nigeria of the output growth and hence the employment prospect that the revitalisation of the moribund refineries and the other enterprises would have generated. Furthermore, the Petroleum Industry Bill (PIB) that would have also rejuvenated the petroleum sector was not passed into law by the Yar'Adua/Jonathan administration. This has denied the sector investment flows, output growth, and employment (Faniran, 2016). Also, the partial privatisation of the power sector was a little late and not properly consummated as the potential benefits have not been attained.

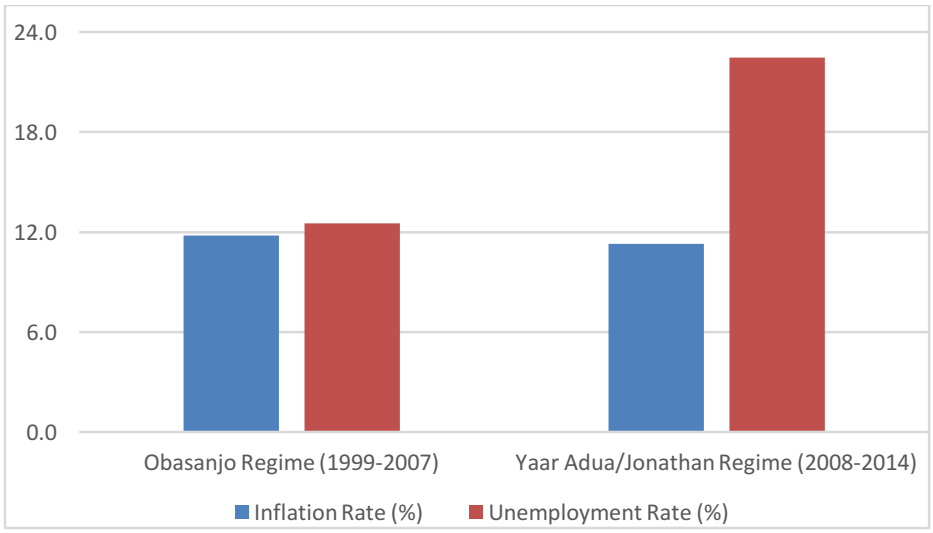

Figure 9: Unemployment and Inflation Rates During Obasanjo vs Yar'Adua/Jonathan Regimes. Source: Author's Analysis of Data collected from the National Bureau of Statistics

4.1.1 Sectoral transition of contributions to GDP and employment between 1981 and 2014

Tables 5 and 6 present, respectively, the sectoral transition of contribution to GDP and the sectoral transition of employment contribution between1981 and 2014. The two tables show the following:

Between 1981 and 2014, the contribution of the Agriculture sector to GDP increased by 48.4% from 15.5% to 23.0%, whereas its contribution to employment declined by 24.5% from 68.3% to 51.6%. In the same period the contribution of Mining and Quarrying sector to GDP declined by 68.0% from 33.1% to 10.6%, but, its contribution to employment remained unchanged at 0.2%. During the review period, the contribution of the manufacturing sector to GDP declined marginally by 1.0% from 10.1% to 10.0%, whereas its contribution to employment decreased substantially by 42.9% from 2.1% to 1.2%. Between 1981 and 2014, the contribution of the Construction sector to GDP declined by 32.1% from 5.6% to 3.8%, whereas, its contribution to employment increased by 40.0% from 0.5% to 0.7%.

In the same period, the contribution of Administration and Social Services declined by 2.4% from 8.5% to 8.3%, whereas its contribution to employment increased by 57.3% from 26.2% to 41.2%. By implications, there has been a relative decline in the productivity of the public sector as more people are doing less. Secondly, the higher relative contribution to employment suggests overstaffing in the public sector, which also partly explains the relatively high recurrent expenditure of government and the high cost of governance. The contribution of Trade and Services to GDP increased by 63.8% from 27.1% to 44.4%, whilst its contribution to employment increased by 66.7% from 2.7% to 4.5%. In the same period, the contribution of total non-Agriculture to GDP declined by 8.9% from 84.5% to 77.0%. However, the contribution to employment increased by 52.7% from 31.7% to 48.4%..

In summary, the following generalisations can be drawn: The Agriculture sector remains a significant and increasing contributor to Nigeria's GDP. Trade and Services sector has emerged as a strong and fast-growing contributor to Nigeria's GDP. It's contribution increased by 63.8% between 1981 and 2014 to a staggering 44.4% of GDP. This is understandable because it consists of the fast-growing ICT and Financial Services sub-sectors of the economy. Employment is transitioning from production in the real sectors of Agriculture and Manufacturing to the Services sectors in Administration and Social Services, as well as Trade and Services sectors. The Public sector (Administration and Social Services) has emerged as a major provider of employment. With its contribution to employment increasing from 26.2% in 1981 to 41.2% in 2014, it is playing catch-up with Agriculture whose contribution to employment, though still high, reduced from 68.3% in 1981 to 51.6% in 2014.

Table 4: Sectoral Transition of Contribution to GDP Between1981 and 2014

Sectors	Agric	Mining & Quarrying	Manufac-turing	Construc-tion	Admin & Social	Trade & Services	Non-Agric	GDP
1981	15.5	33.1	10.1	5.6	8.5	27.1	84.5	100
2014	23.0	10.6	10.0	3.8	8.3	44.4	77.0	100
% Change	48.4	(68.0)	(1.0)	(32.1)	(2.4)	63.8	(8.9)	0.0

Source: Analysis of data collected at National Bureau of Statistics (NBS)

Table 5: Sectoral Transition of Employment Contribution Between1981 and 2014 (%)

Sectors	Agric	Mining & Quarrying	Manufac-turing	Construc-tion	Admin & Social	Trade & Services	Non-Agric	GDP
1981	68.3	0.2	2.1	0.5	26.2	2.7	31.7	100
2014	51.6	0.2	1.2	0.7	41.2	4.5	48.4	100
% Change	(24.5)	0.0	(42.9)	40.0	57.3	66.7	52.7	0.0

Source: Analysis of data collected at National Bureau of Statistics (NBS)

4.2 The employment intensity of aggregate growth in the Nigerian economy during the period, 1981-2014

In this section the interest is in estimating the employment intensity of aggregate growth in the Nigerian economy between 1981 and 2014. To achieve this, the dependent variable of Aggregate Employment (E), and the independent variables of Gross Domestic Product (GDP), Weighted Average Prime Lending Rate (WAPLR), Inflation Rate, and Minimum Wage were first log-linearised to make it amenable to Ordinary Least Square (OLS) regression analysis, address the issues of scale and to enable us be able to interpret the estimated coefficients as elasticity of employment. Subsequently, OLS regression analysis at level was carried out. The results are presented in Table 6:

Table 6: Regression at level in log

Variables	Coefficient (stand. error)	t-Statistic
Dependent variable : Total employment		
Employment Agriculture sector	-0.70 (0.01)	62.17***
Employment non-Agric sector	0.33 (0.02)	20.16***
GVA Agricultural sector	-0.02 (0.01)	-2.19**
GVA non-Agric sector	0.06 (0.01)	4.71***
Inflation	0.00 (0.00)	0.44
WAP_Rate	-0.01 (0.01)	-1.03
Minimum wage	-0.00 (0.00)	-1.91*
Sample	1981- 2014	
Number of observation	34	
R-squared	0.999	
Adjusted R-squared	0.999	
Durbin-Watson stat	1.629	
F-statistic	11620.12***	
Prob(F-statistic)	0.0000	

Source: Author's Analysis of Data collected from the National Bureau of Statistics

The high adjusted R squared of about 0.99, suggests that the variables selected explain about 99% of the variability of the dependent variable, employment level in this case. This is further supported by the very significant (at 1 per cent) F-statistics (at $P<0.001$). In addition, the number (5 out of 7) of significant variables is impressive. However, the value (1.63) of the Durbin-Watson statistics indicates the presence of autocorrelation which nullifies every good attribute identified above concerning the relationship between the explanatory variables and the dependent variable. Consequently, the results are spurious and cannot be used for any policy making, hence the need for the following subsequent steps to make the relation useful for decision making.

Based on the afore-mentioned problem, the first step in the process of making the relationship useful is to conduct the stationarity test to assess the level of unit root or noise or random walk problem in the various series. Stationarity test was then conducted on all the variables used in the model. In this study, the Augmented Dickey-Fuller approach was used to test the null hypothesis that the series contain unit roots problem against the alternative of stationarity. Table 7 below presents the results of the Augmented Dickey-Fuller (ADF) which suggest that only few (four) of the variables were stationary at level, namely the level of employment in mining and construction (measured in number), the level of GDP and the Weighted Average Prime Lending Rate. To correct for this unit root or noise or random walk problem in those series, the non-stationary series must be differenced. All the equations have been estimated with constant terms. The tests further indicated that all the non-stationary series became stationary after the second differencing, suggesting stationary series of order two, I(2). This implies that the order of co-integration is 2 for all the series as shown in Tables 8, 9 and 10.

Table 7: Augmented Dickey-Fuller (ADF) test on series at level

Series	Test Statistic	Interpolated Dickey-Fuller			Order of integration
		1% Critical Value	5% Critical Value	10% Critical Value	
Employment Agriculture	-1.404	-3.696	-2.978	-2.620	
Employment Mining and Quarrying	3.174**	-3.696	-2.978	-2.620	I(0)
Employment Manufacturing	-2.045	-3.696	-2.978	-2.620	
Employment Construction	3.546**	-3.696	-2.978	-2.620	I(0)
Employment Admin & Social Services	2.355	-3.696	-2.978	-2.620	
Employment Trade and Services	1.300	-3.696	-2.978	-2.620	
Employment Non-agriculture	2.687	-3.696	-2.978	-2.620	
Total employment	0.517	-3.696	-2.978	-2.620	
GVA Agriculture	-1.543	-4.334	-3.580	-3.228	
GVA Mining and Quarrying	-0.583	-4.334	-3.580	-3.228	
GVA Manufacturing	0.566	-4.334	-3.580	-3.228	
GVA Construction	-2.437	-4.334	-3.580	-3.228	
GVA Administration and Social Services	-0.593	-4.334	-3.580	-3.228	
GVA Trade and Services	-2.276	-4.334	-3.580	-3.228	
GVA Non-agriculture	-0.874	-4.334	-3.580	-3.228	
GDP	7.247***	-3.696	-2.978	-2.620	I(0)
Inflation_Rate	-2.525	-4.334	-3.580	-3.228	
Unemployment_Rate	-0.457	-3.696	-2.978	-2.620	
WAPLR(Weighted Average Prime Lending Rate)	-3.329**	-3.696	-2.978	-2.620	I(0)
Minimum wage	0.226	-3.696	-2.978	-2.620	

*statistically significant at 10% level
**statistically significant at 5% level
***statistically significant at 1% level

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 8: Augmented Dickey-Fuller (ADF) test on series at First difference

Series	Test Statistic	Interpolated Dickey-Fuller			Order of integration
		1% Critical Value	5% Critical Value	10% Critical Value	
Employment Agriculture	-4.840***	-3.702	-2.980	-2.622	I(1)
Employment Mining and Quarrying	-3.544**	-3.702	-2.980	-2.622	I(1)
Employment Manufacturing	-5.101***	-3.702	-2.980	-2.622	I(1)
Employment Construction	-2.719*	-3.702	-2.980	-2.622	I(1)
Employment Admin & Social Services	-4.444***	-3.702	-2.980	-2.622	I(1)
Employment Trade and Services	-6.451***	-3.702	-2.980	-2.622	I(1)
Employment Non-agriculture	-4.003***	-3.702	-2.980	-2.622	I(1)
Total employment	-3.783***	-3.702	-2.980	-2.622	I(1)
GVA Agriculture	-2.431	-4.343	-3.584	-3.230	
GVA Mining and Quarrying	-3.454*	-4.343	-3.584	-3.230	I(1)
GVA Manufacturing	-1.815	-4.343	-3.584	-3.230	
GVA Construction	-8.086***	-4.343	-3.584	-3.230	I(1)
GVA Administration & Social Services	-1.886	-4.343	-3.584	-3.230	
GVA Trade and Services	-1.516	-4.343	-3.584	-3.230	
GVA Non-agriculture	-2.277	-4.343	-3.584	-3.230	
GDP	-1.827	-3.702	-2.980	-2.622	
Inflation_Rate	-4.105**	-4.343	-3.584	-3.230	I(1)
Unemployment_Rate	-7.298***	-3.702	-2.980	-2.622	I(1)
WAPLR(Weighted Average Prime Lending Rate)	-8.986***	-3.702	-2.980	-2.622	I(1)
Minimum wage	-5.930***	-3.702	-2.980	-2.622	I(1)

*statistically significant at 10% level
**statistically significant at 5% level
***statistically significant at 1% level

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 9: Augmented Dickey-Fuller (ADF) test on series at second difference

Series	Test Statistic	Interpolated Dickey-Fuller			Order of integration
		1% Critical Value	5% Critical Value	10% Critical Value	
Employment Agriculture	-6.273***	-3.709	-2.983	-2.623	I(2)
Employment Mining and Quarrying	-7.158***	-3.709	-2.983	-2.623	I(2)
Employment Manufacturing	-9.336***	-3.709	-2.983	-2.623	I(2)
Employment Construction	-6.056***	-3.709	-2.983	-2.623	I(2)
Employment Admin &Social Services	-12.53***	-3.709	-2.983	-2.623	I(2)
Employment Trade and Services	-9.830***	-3.709	-2.983	-2.623	I(2)
Employment Non-agriculture	-11.72***	-3.709	-2.983	-2.623	I(2)
Total employment	-5.843***	-3.709	-2.983	-2.623	I(2)
GVA Agriculture	-4.305**	-4.352	-3.588	-3.233	I(2)
GVA Mining and Quarrying	-4.897***	-4.352	-3.588	-3.233	I(2)
GVA Manufacturing	-4.073**	-4.352	-3.588	-3.233	I(2)
GVA Construction	-3.568*	-4.352	-3.588	-3.233	I(2)
GVA Admin & Social Services	-3.410*	-4.352	-3.588	-3.233	I(2)
GVA Trade and Services	-2.297	-4.352	-3.588	-3.233	
GVA Non-agriculture	-3.949**	-4.352	-3.588	-3.233	I(2)
GDP	-9.171***	-3.709	-2.983	-2.623	I(2)
Inflation Rate	-5.319***	-4.352	-3.588	-3.233	I(2)
Unemployment Rate	-11.67***	-3.709	-2.983	-2.623	I(2)
WAPLR(Weighted Average Prime Lending Rate)	-12.12***	-3.709	-2.983	-2.623	I(2)
Minimum wage	-9.939***	-3.709	-2.983	-2.623	I(2)

*statistically significant at 10% level
**statistically significant at 5% level
***statistically significant at 1% level
Source: Author's Analysis of Data collected from the National Bureau of Statistics

In all the cases but one (Trade and Services), the hypothesis of the presence of unit root in the series at second difference is rejected because the test statistic is more negative than the critical value, majority even at a 1% level of significance. Therefore, (vector auto regression) VAR analysis can be performed on the series after second differencing.

Subsequently, co-integration test at order 2 was carried out to determine whether there were long-run stable relationships among the variables. The tables below present the results of the co-integration test.

Meanwhile, to assist in our analysis, six plausible total employment equation scenarios were developed from the series as follows: -

Scenario 1: lntot_empl = f(lnemp_agric, lnemp_non-agric, lngva_agric, lngva_nonagric.)….(17)

Scenario 2: lntot_empl = f(lnemp_agric, lnemp_minin, lnemp_manufac, lnemp_const, lnemp_admin, lngva_agric, lngva_minin, lngva_manufac, lngva_const, lngva_admin)……..(18)

Scenario 3: lntot_empl = f(lnemp_agric, lnemp_mini, lnemp_manufac, lnemp_const, lnemp_admin, lninflation,lnwap_rate, lnminWage)……..……(19)

Scenario 4: lntot_empl = f(lngva_agric, lngva_minin, lngva_manufac, lngva_const, lngva_admin lninflation, lnwap_rate, lnminimWage).....(20)

Scenario 5: lntot_empl = f(lngdp, lninflation, lnwap_rate, lnminim_wage).....(21)

Scenario 6: lnemp_agric =f(lnemp_minin, lnemp_manufac, lnemp_const, lnemp_admin lngva_agric, lngva_minin, lngva_manufac, lngva_const, lngva_admin)……....(22)

Johansen cointegration test was performed for each of the scenarios. However, to consistently test for cointegration, we must choose the appropriate lag length. The varsoc command in Stata software was used in making that determination. We then use the vecrank command to test for cointegration via Johansen's max-eigenvalue statistic and trace statistic. The results for the maximum lag to be used is presented in tables 11 to 16 below:

Table 10: Maximum lags for scenario 1 [Total employment defined as a function of employment in agriculture, employment in non-agriculture(together), GVA agriculture, and GVA non-agriculture(together)]

Sample: 1985 - 2014 Number of obs = 30

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	232.833				1.7e-13	-15.1889	-15.1142	-14.9553
1	400.819	335.97	25	0.000	1.3e-17	-24.7213	-24.273	-23.3201
2	435.728	69.817	25	0.000	7.8e-18	-25.3819	-24.5601	-22.813
3	482.963	94.47	25	0.000	2.7e-18	-26.8642	-25.6688	-23.1276
4	539.375	112.82*	25	0.000	9.7e-19*	-28.9583*	-27.3894*	-24.0541*

Endogenous: lntot_empl lnemp_agric lnemp_nonagric lngva_agric lngva_nonagric
Exogenous: _cons

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 11: Maximum lags for scenario 2 (Total employment defined as a function of employment in all the individual sectors and also of GVA in all the individual sectors)
Sample: 1985 - 2014 Number of obs = 30

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	639.659				1.7e-32	-41.9106	-41.7462	-41.3968
1	1014.62	749.92	121	0.000	1.3e-39	-58.8413	-56.869	-52.676
2	3322.7	4616.2	121	0.000	8.e-101*	-204.647	-200.866	-192.83
3	9629.47	12614	121	0.000	.	-619.965	-615.034	-604.552
4	9899.61	540.27*	121	0.000	.	-637.974*	-633.043*	-622.561*

Endogenous: lntot_empl lnemp_agric lnemp_minin lnemp_manufac lnemp_const lnemp_admin lngva_agric lngva_
minin lngva_manufac lngva_const lngva_admin Exogenous: _cons
Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 12: Maximum lags for scenario 3 (Total employment defined as a function of employment in all the individual sectors, and also as a function of wage rate, interest rate, and inflation rate)

Sample: 1985 - 2014 Number of obs = 30

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	382.961				1.2e-22	-24.9307	-24.7962	-24.5103
1	657.095	548.27	81	0.000	3.9e-28	-37.8063	-36.4616	-33.6028
2	837.668	361.15	81	0.000	3.1e-30	-44.4446	-41.8895	-36.4577
3	4645.46	7615.6	81	0.000	4.e-133*	-292.897	-289.132	-281.127
4	7698.99	6107*	81	0.000	.	-495.266*	-491.231*	-482.655*

Endogenous: lntot_empl lnemp_agric lnemp_minin lnemp_manufac lnemp_const lnemp_admin lninflation lnwap_rate lnminim_wage
Exogenous: _cons
Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 13: Maximum lags for scenario 4 (Total employment defined as a function of GVA in all the individual sectors and also as a function of wage rate, interest rate, and inflation rate)

Sample: 1985 - 2014 Number of obs = 30

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	127.327				3.0e-15	-7.88845	-7.75397	-7.46809
1	399.752	544.85	81	0.000	1.1e-20	-20.6502	-19.3054	-16.4466
2	539.386	279.27*	81	0.000	1.3e-21	-24.559	-22.004	-16.5722
3			81	.	-1.e-130*			
4	8141.15	.	81	.	.	-524.743*	-520.709*	-512.132*

Endogenous: lntot_empl lngva_agric lngva_minin lngva_manufac lngva_const lngva_admin lninflation lnwap_rate lnminim_wage
Exogenous: _cons
Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 14: Maximum lags for scenario 5 (Total employment defined as a function of GDP, wage rate, interest rate, and inflation rate)

Sample: 1985 - 2014 Number of obs = 30

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	-33.4551				8.9e-06	2.56367	2.63838	2.7972
1	135.518	337.95	25	0.000	6.2e-10	-7.03454	-6.58629	-5.63335
2	166.519	62.001	25	0.000	4.9e-10	-7.43457	-6.61277	-4.86571
3	199.728	66.419	25	0.000	4.3e-10	-7.98188	-6.78653	-4.24535
4	274.755	150.05*	25	0.000	4.5e-11*	-11.317*	-9.74813*	-6.41284*

Endogenous: lntot_empl lngdp lninflation lnwap_rate lnminim_wage
Exogenous: _cons
Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 15: Maximum lags for scenario 6 (Employment in agriculture defined as a function of employment in and GVAs of all the various other sectors)

Sample: 1985 - 2014 Number of obs = 30

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	506.968				1.9e-27	-33.1312	-32.9818	-32.6641
1	866.843	719.75	100	0.000	8.3e-35	-50.4562	-48.8126	-45.3185
2	1593.49	1453.3	100	0.000	1.2e-51*	-92.2328	-89.095	-82.4244
3	8667.29	14148	100	0.000	.	-557.819	-553.337	-543.807
4	8954.86	575.14*	100	0.000	.	-576.991*	-572.508*	-562.979*

Endogenous: lnemp_agric lnemp_minin lnemp_manufac lnemp_const lnemp_admin lngva_agric lngva_minin lngva_manufac lngva_const lngva_admin
Exogenous: _cons
Source: Author's Analysis of Data collected from the National Bureau of Statistics

The results presented in the above tables for the six scenarios reveal that the maximum lag to be considered in the Johanson test is 4 to consistently test for cointegration and run the VECM - Vector Error Correction Model.

The results of Johansen cointegration tests for the different scenarios are presented in tables 17 to 22. In general, both trace and maximum Eigen value statistics indicate that the number of cointegrating equations vary between 0 to 8 cointegrating equations among the started series across the different scenarios. This means that there is the possibility of stable long run relationships among the variables under study.

Table 16: Johansen tests for co-integration for Scenario 1 [Total employment defined as a function of employment in agriculture, employment in non-agriculture(together), GVA agriculture, and GVA non-agriculture (together)]

Trend: constant
Number of obs = 32
Sample: 1983 - 2014
Lags = 2

Using Trace Statistics

Maximum rank	parms	LL	eigenvalue	Trace statistic	5% critical value
0	72	384.59342	.	316.2502	156.00
1	87	434.22609	0.95504	216.9849	124.24
2	100	475.63547	0.92484	134.1661	94.15
3	111	501.1214	0.79666	83.1942	68.52
4	120	519.49524	0.68284	46.4466*	47.21
5	127	531.70723	0.53385	22.0226	29.68
6	132	539.71009	0.39358	6.0169	15.41
7	135	542.52134	0.16113	0.3944	3.76
8	136	542.71852	0.01225		

3 cointegrating equations

Using Maximum eigen Value

Maximum rank	parms	LL	eigenvalue	Max statistic	5% critical value
0	72	384.59342	.	99.2654	51.42
1	87	434.22609	0.95504	82.8188	45.28
2	100	475.63547	0.92484	50.9719	39.37
3	111	501.1214	0.79666	36.7477	33.46
4	120	519.49524	0.68284	24.4240	27.07
5	127	531.70723	0.53385	16.0057	20.97
6	132	539.71009	0.39358	5.6225	14.07
7	135	542.52134	0.16113	0.3944	3.76
8	136	542.71852	0.01225		

3 Cointegrating equations

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 17: Johansen tests for co-integration for Scenario 2 (Total employment defined as a function of employment in all the individual sectors and also of GVA in all the individual sectors)

Trend: constant
Number of obs = 32
Sample: 1983 - 2014
Lags = 2

Using Trace Statistics

Maximum rank	Parms	LL	eigenvalue	Trace statistic	5% critical value
0	90	703.43357	.	515.0953	192.89
1	107	802.75294	0.99799	316.4566	156.00
2	122	849.66516	0.94671	222.6321	124.24
3	135	888.09248	0.90944	145.7775	94.15
4	146	911.96564	0.77509	98.0312	68.52
5	155	932.73588	0.72696	56.4907	47.21
6	162	947.48405	0.60218	26.9943*	29.68
7	167	954.3696	0.34972	13.2232	15.41
8	170	959.47349	0.27312	3.0155	3.76
9	171	960.98122	0.08993		

5 cointegrating equations

Using Maximum eigen Value

Maximum rank	Parms	LL	eigenvalue	Max statistic	5% critical value
0	90	703.43357	.	198.6387	57.12
1	107	802.75294	0.99799	93.8244	51.42
2	122	849.66516	0.94671	76.8546	45.28
3	135	888.09248	0.90944	47.7463	39.37
4	146	911.96564	0.77509	41.5405	33.46
5	155	932.73588	0.72696	29.4963	27.07
6	162	947.48405	0.60218	13.7711	20.97
7	167	954.3696	0.34972	10.2078	14.07
8	170	959.47349	0.27312	3.0155	3.76
9	171	960.98122	0.08993		

5 Cointegrating equations

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 18: Johansen tests for co-integration for Scenario 3 (Total employment defined as a function of employment in all the individual sectors, and also as a function of wage rate, interest rate, and inflation rate)

Trend: constant
Number of obs = 32
Sample: 1983 - 2014
Lags = 2

Using Trace Statistics

Maximum rank	Parms	LL	eigenvalue	Trace statistic	5% critical value
0	90	653.22072	.	381.8673	192.89
1	107	719.11555	0.98373	250.0777	156.00
2	122	757.8013	0.91089	172.7062	124.24
3	135	791.06505	0.87494	106.1787	94.15
4	146	808.70922	0.66805	70.8903	68.52
5	155	822.3745	0.57433	43.5598*	47.21
6	162	831.82157	0.44592	24.6656	29.68
7	167	838.25484	0.33107	11.7991	15.41
8	170	842.3862	0.22757	3.5364	3.76
9	171	844.15439	0.10462		

4 cointegrating equations

Using Maximum eigen Value

Maximum rank	Parms	LL	eigenvalue	Max statistic	5% critical value
0	90	653.22072		131.7897	57.12
1	107	719.11555	0.98373	77.3715	51.42
2	122	757.8013	0.91089	66.5275	45.28
3	135	791.06505	0.87494	35.2883	39.37
4	146	808.70922	0.66805	27.3306	33.46
5	155	822.3745	0.57433	18.8941	27.07
6	162	831.82157	0.44592	12.8665	20.97
7	167	838.25484	0.33107	8.2627	14.07
8	170	842.3862	0.22757	3.5364	3.76
9	171	844.15439	0.10462		

2 Cointegrating equations

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 19: Johansen tests for co-integration for Scenario 4 (Total employment defined as a function of GVA in all the individual sectors and also as a function of wage rate, interest rate, and inflation rate)

Trend: constant
Number of obs = 32
Sample: 1983 - 2014
Lags = 2

Using Trace Statistics

Maximum rank	parms	LL	eigenvalue	Trace statistic	5% critical value
0	90	323.88294	.	393.8059	192.89
1	107	374.12249	0.95672	293.3268	156.00
2	122	418.07615	0.93589	205.4195	124.24
3	135	448.35205	0.84927	144.8677	94.15
4	146	470.90783	0.75579	99.7562	68.52
5	155	490.37945	0.70388	60.8129	47.21
6	162	505.28528	0.60608	31.0013	29.68
7	167	513.41483	0.39836	14.7422*	15.41
8	170	520.4542	0.35594	0.6634	3.76
9	171	520.78591	0.02052		

6 cointegrating equations

Using Maximum eigen Value

Maximum rank	parms	LL	eigenvalue	Max statistic	5% critical value
0	90	323.88294	.	100.4791	57.12
1	107	374.12249	0.95672	87.9073	51.42
2	122	418.07615	0.93589	60.5518	45.28
3	135	448.35205	0.84927	45.1116	39.37
4	146	470.90783	0.75579	38.9432	33.46
5	155	490.37945	0.70388	29.8116	27.07
6	162	505.28528	0.60608	16.2591	20.97
7	167	513.41483	0.39836	14.0787	14.07
8	170	520.4542	0.35594	0.6634	3.76
9	171	520.78591	0.02052		

5 Cointegrating equations

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 20: Johansen tests for co-integration for Scenario 5 (Total employment defined as a function of GDP, wage rate, interest rate, and inflation rate)

Trend: constant
Number of obs = 32
Sample: 1983 - 2014
Lags = 2

Using Trace Statistics

Maximum rank	parms	LL	eigenvalue	Trace statistic	5% critical value
0	30	134.63045	.	74.6773	68.52
1	39	151.31823	0.64760	41.3017*	47.21
2	46	160.80345	0.44724	22.3312	29.68
3	51	168.43967	0.37952	7.0588	15.41
4	54	171.90281	0.19462	0.1325	3.76
5	55	171.96907	0.00413		

0 cointegrating equations

Using Maximum eigen Value

Maximum rank	parms	LL	eigenvalue	Max statistic	5% critical value
0	30	134.63045	.	33.3756	33.46
1	39	151.31823	0.64760	18.9704	27.07
2	46	160.80345	0.44724	15.2724	20.97
3	51	168.43967	0.37952	6.9263	14.07
4	54	171.90281	0.19462	0.1325	3.76
5	55	171.96907	0.00413		

0 Cointegrating equations

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 21: Johansen tests for co-integration for Scenario 6 (Employment in agriculture defined as a function of employment in and GVAs of all the various other sectors

Trend: constant
Number of obs = 32
Sample: 1983 - 2014
Lags = 2

Using Trace Statistics

Maximum rank	parms	LL	eigenvalue	Trace statistic	5% critical value
0	110	800.69821	.	620.2418	233.13
1	129	876.82475	0.99142	467.9887	192.89
2	146	935.61753	0.97464	350.4032	156.00
3	161	984.6025	0.95319	252.4332	124.24
4	174	1024.3014	0.91636	173.0354	94.15
5	185	1056.6796	0.86783	108.2790	68.52
6	194	1076.6254	0.71252	68.3874	47.21
7	201	1091.1514	0.59662	39.3354	29.68
8	206	1101.5255	0.47711	18.5873	15.41
9	209	1109.2945	0.38465	3.0492*	3.76
10	10	210	1110.8191	0.09089	

8 cointegrating equations

Using Maximum eigen Value

Maximum rank	parms	LL	eigenvalue	Max statistic	5% critical value
0	110	800.69821	.	152.2531	62.81
1	129	876.82475	0.99142	117.5856	57.12
2	146	935.61753	0.97464	97.9699	51.42
3	161	984.6025	0.95319	79.3978	45.28
4	174	1024.3014	0.91636	64.7564	39.37
5	185	1056.6796	0.86783	39.8916	33.46
6	194	1076.6254	0.71252	29.0520	27.07
7	201	1091.1514	0.59662	20.7481	20.97
8	206	1101.5255	0.47711	15.5381	14.07
9	209	1109.2945	0.38465	3.0492	3.76
10	210	1110.8191	0.09089		

8 Cointegrating equations

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Vector Error Correction Model (VECM)

The vector error correction model is the regression that takes into account the correction of the noise/unit root problem in the model as well as estimating the part of that noise that is being removed at each short run. The results of the VECM are presented in the subsequent tables 25 to 30 below for equations (14) through (19). The summaries are first presented in tables 23 and 24.

Table 22: Summary Statistics of Aggregate and Sectoral Coefficients Of Employment

Equation	Parms	RMSE	R^2	Chi^2	$P > Chi^2$
D_emp _GDP	9	.028222	0.8518	126.4906	0.0000
D_emp_Agric	9	.017421	0.7092	53.64271	0.0000
D_emp_Min & Qua	10	.018232	0.7434	63.74114	0.0000
D_emp_Manu	9	.039786	0.3902	14.07551	0.1179
D_emp_Const	9	.018434	0.8794	160.3941	0.0000
D_emp_Admin & Soc	9	.015881	0.9189	249.1586	0.0000

Source: Author's Analysis of Data collected from the National Bureau of Statistics

The estimates of equations 14 through 19 (since the series in equation 20 was not stationary and therefore not estimated) indicate that, except for employment equations of total GDP, Admin and Social Services, and the Construction sectors, the R^2s were below 0.9000, suggesting that the equations have not explained employment situations. Furthermore, table 23 suggests that none of the coefficients were significant at 95 % confidence level.

Table 23: Summary Statistics 1 of Aggregate and Sectoral Coefficients of Employment

Dependent Variable	Coefficient (Standard Deviation)	t-Statistic
D (Gross Domestic Product)	0.03(0.11)	0.31
D (Agriculture)	0.11(0.19)	0.56
D (Mining & Quarrying)	0.14(0.20)	0.71
D (Manufacturing)	0.01(0.18)	0.05
D (Construction)	0.48(0.16)	3.10
D (Administration and Social Services)	-0.23(0.19)	-1.22

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 24: Equation 8 (Regression results for aggregate employment)

AGG_ EMP = f(GDPt, Wt, Rt, Yt)

Vector error-correction model

Sample: 1983 - 2014		Number of obs	= 32
		AIC	= -6,251634
Log likelihood = 151,0261		HQIC	= -5,47731
Det(Sigma_ml) = 5,47e-11		SBIC	= -3,915617

Equation	Parms	RMSE	R-sq	Chi2	P>chi2
D_lnemp_agric	9	.017324	0.7124	54,4945	0.0000
D_1nGDP	9	.028222	0.8518	126,4306	0.0000
D_lninflation	9	.583351	0.5708	29,26123	0.0006
D_lnWAPL_rate	9	.167596	0.6048	33,67152	0.0001
D_lnminim_wage	9	.457793	0.3228	10,4869	0.3125

	Coef.	Std.Err.	z	P>|z|	[95% Conf.	Interval]
D_lnemp_agric _ce1 |	-0.15	0.07	-2,28	0,023	-0,29	-0.02
_ce2 |	0.03	0.01	2.70	0.007	0.01	0.06
_ce3 |	0.01	0.01	1.67	0.096	-0.00	0.02
lnemp_agric |	0.10	0.19	0.54	0.588	-0.26	0.47
lnGDP |	-0.03	0.11	0.31	0.759	-0.18	0.24
lninflation |	-0.01	0.01	-0.90	0.368	-0.02	0.01
lnWAPL_rate |	-0.01	0.02	-0.54	0.587	-0.04	0.02
lnminim_wage |	-0.00	0.01	-0.33	0.742	-0.02	0.01
Constant |	0.03	0.01	3.91	0.000	0.02	0.05

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 25: Equation 9 (Regression results for employment in Agriculture)

EMP_AGRIC =f(GVA_AGRICt, Wt, Rt, ¥t)

Vector error-correction model

Sample: 1983 - 2014	Number of obs	=	32
	AIC	=	-4,023222
Log likelihood = 115,3716	HQIC	=	-3,248899
Det(Sigma_ml) = 5,08e-10	SBIC	=	-1,687206

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnemp_agric	9	.017421	0.7092	53,64271	0.0000
D_lngva_agric	9	.080757	0.5028	22,24944	0.0081
D_lninflation	9	.625715	0.5062	22,55487	0.0073
D_lnWAPL_rate	9	.16704	0.6074	34,04289	0.0001
D_lnminim_wage	9	.446067	0.3571	12,21743	0.2013

	Coef.	Std.Err.	z	P>|z|	[95%Conf.	Interval]
D_lnemp_agric _ce1 |	-0.19	0.07	-2.68	0.007	-0.32	-0.05
_ce2 |	0.04	0.01	2.87	0.004	0.01	0.06
_ce3	0.01	0.01	1.60	0.109	-0.00	0.02
lnemp_agric |	0.11	0.19	0.56	0.573	-0.26	0.47
lngva_agric |	-0.02	0.05	-0.34	0.737	-0.10	0.07
lninflation |	-0.01	0.01	-1.09	0.277	-0.02	0.00
lnWAPL_rate |	-0.01	0.02	-0.79	0.429	-0.05	0.02
Lnminim_wage|	-0.00	0.01	-0.13	0.898	-0.02	0.01
Constant |	0.03	0.01	4.06	0.000	0.02	0.04

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 26: Equation 10 (Regression results for employment in Mining and Quarrying)

EMP_MIN&QUA =f(GVA_MIN&QUAt, Wt, Rt, ¥t)

Vector error-correction model

Sample: 1983 - 2014	Number of obs	= 32
	AIC	= -4,185445
Log likelihood = 120,9671	HQIC	= -3,365573
Det(Sigma_ml) = 3,58e-10	SBIC	= -1,712016

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnemp_minin	10	.018232	0.7434	63,74114	0.0000
D_lngva_minin	10	.072302	0.4861	20,81174	0.0224
D_lninflation	10	.574501	0.6018	33,2551	0.0002
D_lnWAPL_rate	10	.171806	0.6028	33,38448	0.0002
D_lnminim_wage	10	.466728	0.3267	10,67559	0.3833

	Coef.	Std.Err.	z	P>|z|	[95% Conf.	Interval]
D_lnemp_minin _ce1 |	-0.00	0.04	-0.01	0.994	-0.07	0.07
_ce2 |	-0.08	0.04	-1.90	0.057	-0.00	0.16
_ce3 |	0.01	0.01	0.92	0.360	-0.01	0.02
lnemp_minin |	0.14	0.20	0.71	0.477	-0.25	0.53
lngva_minin |	-0.05	0.04	-1.21	0.225	-0.13	0.03
lninflation |	-0.00	0.01	-0.57	0.566	-0.01	0.01
lnwWAPL_rate	0.03	0.02	1.34	0.180	-0.01	0.06
lnminim_wage|	-0.01	0.01	-1.38	0.169	-0.03	0.00
Constant |	0.03	0.01	2.76	0.006	0.01	0.05

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 27: Equation 11 (Regression results for employment in Manufacturing)

EMP_MANU =f(GVA_MANUt , Wt, Rt, ¥t)

Vector error-correction model

Sample: 1983 - 2014		Number of obs	= 32
		AIC	= -1,716852
Log likelihood	= 78,46964	HQIC	= -,9425288
Det(Sigma_ml)	= 5,10e-09	SBIC	= ,6191644

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnemp_manufac	9	.039786	0,3902	14,07551	0.1197
D_lngva_manufac	9	.127828	0.3163	10,17859	0.3362
D_lninflation	9	.600862	0.5447	26,31688	0.0018
D_lnWAPL_rate	9	.164978	0.6171	35,45211	0.0000
D_lnwap_rate	9	.46972	0.2871	8,858094	0.4505

	Coef.	Std.Err.	Z	P>|z|	[95% conf	Interval]
D_lnemp_manufac _ce1	-0.29	0.10	-2.85	0.004	-0.49	-0.09
_ce2 |	-0.06	0.02	-3.19	0.001	-0.10	-0.02
_ce3 |	0.02	0.02	1.10	0.271	-0.01	0.05
lnemp_manufac |	0.01	0.18	0.05	0.962	-0.35	0.37
lngva_manufac |	0.04	0.08	0.51	0.611	-0.11	0.19
lninflation |	-0.01	0.01	-0.69	0.490	-0.03	0.02
lnWAPL_rate |	-0.02	0.04	-0.55	0.584	-0.10	0.05
lnminim_wage |	-0.01	0.02	-0.53	0.596	-0.04	0.03
Constant|	0.06	0.02	3.40	0.001	0.02	0.09

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 28: Equation 12 (Regression results for employment in Construction)

EMP_CONST =f(GVA_CONSTt , Wt, Rt, ¥t)

Vector error-correction model

Sample: 1983 - 2014 Number of obs = 32

AIC = -4,710923

Log likelihood = 126,3748 HQIC = -3,9366

Det(Sigma_ml) = 2,55e-10 SBIC = -2,374906

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnemp_const	9	.018434	0.8794	160,3941	0.0000
D_lngva_const	9	.065711	0.7546	67,64931	0.0000
D_lninflation	9	.599222	0.5472	26,58179	0.0016
D_lnWAPL_rate	9	.15147	0.6772	46,15638	0.0000
D_lnminim_wage	9	.474076	0.2738	8,2936	0.5049

	Coef.	Std.Err.	Z	P>|z|	[95% Conf.	Interval]
D_lnemp_const _ce1 |	-0.07	0.04	-1.83	0.067	-0.15	0.01
_ce2 |	0.02	0.02	1.22	0.223	-0.01	0.05
_ce3 |	0.01	0.01	1.62	0.104	-0.00	0.03
lnemp_const |	0.48	0.16	3.10	0.002	0.18	0.79
lngva_const |	0.12	0.06	2.13	0.034	0.01	0.24
lninflation |	-0.02	0.01	-2.58	0.010	-0.03	-0.00
lnwap_rate |	0.01	0.02	0.69	0.491	-0.02	0.05
lnminim_wage|	-0.01	0.01	-1.91	0.056	-0.03	0.00
Constant |	0.04	0.01	3.28	0.001	0.02	0.06

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 29: Equation 13 (Regression results for employment in Admin and Social Services)

EMP_ADM&SOC =f(GVA_ADM&SOCt, Wt, Rt, ¥t)

Vector error-correction model

Sample: 1983 - 2014		Number of obs	= 32
		AIC	= -6,391025
Log likelihood	= 153,2564	HQIC	= -5,616702
Det(Sigma_ml)	= 4,76e-11	SBIC	= -4,055009

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnemp_admin	9	.015881	0.9189	249,1586	0.0000
D_lngva_admin	9	.024777	0.8594	134,4368	0.0000
D_lninflation	9	.620644	0.5142	23,2859	0.0056
D_lnWAPL_rate	9	.183715	0.5252	24,33107	0.0038
D_lnminim_wage	9	.439396	0.3761	13,26425	0.1510

	Coef.	Std.Err.	Z	P>|z|	[95%Conf.	Interval]
D_lnemp_admin | _ce1 |	-0.14	0.04	-3.59	0.000	-0.21	-0.06
_ce2 |	0.11	0.03	3.73	0.000	0.05	0.16
_ce3 |	0.00	0.01	0.31	0.757	-0.01	0.01
lnemp_admin |	-0.23	0.19	-1.22	0.222	-0.60	0.14
lngva_admin	0.10	0.13	0.75	0.455	-0.16	0.35
lninflation |	0.00	0.00	-0.73	0.463	-0.01	0.01
lnWAPL_rate |	-0.01	0.01	-0.96	0.336	-0.04	0.01
lnminim_wage |	-0.01	0.01	-1.46	0.144	-0.02	0.00
Constant |	0.06	0.01	5.86	0.000	0.04	0.09

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Consequently, the employment situation in the economy at large and in the various sectors were further examined by developing a system of simultaneous equations (21), which not only emphasised the interdependence of all the sectors operating simultaneously in the economy, but helps to remove any possible problem of autocorrelation. The results of the estimation of the simultaneous equations (21) are presented below.

First, table 30 overleaf presents the summary statistics of the model. It shows the goodness of fit of the VECM estimates through high R-square for all the equations.

Table 30: VECM summary for different sectors

Vector error-correction model	
Sample:	1984 - 2014
Number of obs:	31
AIC:	73.11768
Log likelihood:	-939.324
HQIC:	76.04297
Det(Sigma_ml):	9.87e+13
SBIC:	82.09166

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_emp_agric	17	136.7	0.9827	683.1095	0.0000
D_emp_min&qua	17	.232187	0.9953	2563.683	0.0000
D_emp_manufac	17	13.4972	0.9355	174.1745	0.0000
D_emp_const	17	1.37641	0.9952	2465.981	0.0000
D_emp_adm&soc	17	131.47	0.9841	745.0906	0.0000
D_emp_tra&ser	17	17.8609	0.9935	1823.052	0.0000
D_gdp	17	577.181	0.9699	386.4155	0.0000
D_inflation	17	17.0338	0.3359	6.070223	0.9927
D_wap_rate	17	5.00535	0.4279	8.974307	0.9411
D_minim_wage	17	706.7	0.9486	221.6156	0.0000

Source: Author's Analysis of Data collected from the National Bureau of Statistics

4.2.1: Employment intensity of aggregate growth.

Table 31 presents the result of the analysis of the employment intensity of aggregate growth in the economy during the period under review.

Table 31: Employment intensity of aggregate growth

Variables	Coefficient (stand. error)	t-Statistic
Dependent variable : D(Total employment)		
Ce1	-0.03(0.03)	-1,05
Ce2	0.00(0.01)	0.28
D(Total Employment (-1))	0.26(0.19)	1.41
D(GDP)	0.21(0.11)	1.90
D(Inflation (-1))	-0.97(7.97)	-0,12
D(WAP_Rate(-1))	-9.71(27.23)	-0,36
D(Minimum wage(-1))	-0.02(0.06)	-0,34
Sample	1981 2014	
Number of observation	34	

Source: Author's Analysis of Data collected from the National Bureau of Statistics

From the analysis in Table 31, employment was encouraged by GDP growth. However, although employment was positively correlated with GDP, with a coefficient of 0.21, the relationship was not significant. This implies that economic growth was 'jobless' during the period. Furthermore, previous level of employment influenced current employment level. The result also showed that inflation, interest rate and wage rate were negatively correlated with employment during the period. However, like GDP, the relationships were not significant.

4.3: Sectoral Employment Intensity of Growth

The tables below present the estimates of the VECM for employment in different sectors of the economy.

Tables 32: Employment in agriculture sector

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6
	Coef. (z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)
Ce1	2.45(1.34)	0.128(2.99)***	-3.135(-0.79)	-1.252(-3.34)***	-	-0.0611(-0.39)
Ce2	-2.07(-2.13) **	-0.114(-2.62)***	3.328(1.11)	-0.986(-3.72)***	-	0.009(0.33)
Ce3	-.497(-0.65)	0.275(2.95)***	-0.416(-1.26)	2.133(3.56)***	-	0.141(0.43)
Ce4		-0.119(-3.08)***	-	-	-	-
Employment Agriculture(-1)	0.11(0.08)	-0.705(-2.26)**	-2.678(-1.24)	-	-	-
Employment Agriculture(-2)	-1.94(-2.08)**	0.156(0.36)	-0.497(-0.49)	-	-	-0.171(-0.3)
Employment Mining(-1)	-	-0.449(-1.22)	-	-	-	-0.29(-0.73)
Employment Mining(-2)	-	-0.309(-0.74)	-	-	-	-0.038(-0.06)
Employment Manufacturing (-1)	-	-0.112(-0.67)	-	-	-	-0.734(-1.33)
Employment Manufacturing (-2)	-	-0.354(-1.97)**	-	-	-	-0.006(-0.02)
Employment Construction(-1)	-	0.081(0.17)	-	-	-	-0.012(-0.03)
Employment Construction(-2)	-	-0.649(-1.54)	-	-	-	-0.122(-0.16)
Employment Admin(-1)	-	-0.027(-0.07)	-	-	-	0.074 (0.12)
Employment Admin(-2)	-	0.913(2.30)**	-	-	-	-0.06(-0.56)
Employment Trade	-	-	-	-	-	0.051(0.62)
Employment Non-agric(-1)	-0.25(-0.35)	-	-	-	-	-
Employment Non-agric(-2)	1.15(2.23)**	-	-	-	-	-
GVA Agriculture(-1)	-0.13(-2.10)**	-0.0653(-1.98)**	-	-	-	-
GVA Agriculture(-2)	0.018(0.34)	0.0356(0.96)	-	1.18(3.75)***	-	-0.06(-0.56)
GVA Mining(-1)	-	0.115(1.98)**	1.219(1.23)	0.561(2.29)**	-	0.051(0.62)
GVA Mining(-2)	-	0.126(3.54)***	0.843(0.90)	-0.184(-0.51)	-	0.014(0.17)
GVA Manufacturing (-1)	-	-0.022(-0.6)	0.089(0.09)	-0.205(-0.8)	-	0.107(1.26)
GVA Manufacturing (-2)	-	-0.069(-1.91)*	-0.332(-0.55)	-0.252(-0.56)	-	-0.0005(-0.01)
GVA Construction(-1)	-	-0.003(-0.10)	-2.303(-0.94)	-0.538(-2.82)***	-	-0.003(0.09)
GVA Construction(-2)	-	-0.14(-2.80)***	-1.589(-0.90)	0.757(3.77) ***	-	-0.016(-0.18)
GVA Admin (-1)	-	0.64(3.83)***	0.974(0.92)	0.506(2.33) **	-	-0.023(-0.46)
GVA Admin (-2)	-	0.48(4.31)***	1.492(1.34)	-1.405(-2.61) ***	-	0.177(0.54)
GVA Trade	-	-	-	-2.669(-4.23) ***	-	0.259(0.9)
GVA Non-agric(-1)	0.085(0.70)	-	-	-	-	-
GVA Non-agric(-2)	0.39(2.59)**	-	-	-	-	-
GDP	-	-	-	-	-	-
Inflation Rate(-1)	-0.002(-0.34)	-	-0.008(-0.72)	-	-	-
Inflation Rate(-2)	0.008(1.21)	-	-0.001(-0.18)	-	-	-
WAPLR(Weighted Average Prime Lending Rate)(-1)	-0.03(-1.56)	-	-0.052(-1.25)	-0.008(-0.42)	-	-0.0008(-0.11)
WAPLR(Weighted Average Prime Lending Rate)(-2)	-0.011(-0.67)	-	-0.037(-1.22)	-0.0002(-0.01)	-	0.006(0.83)
Minimum wage (-1)	-0.023(-2.10)**	-	-0.007(0.98)	0.556(3.47)***	-	-
Minimum wage (-2)	-0.009(-1.06)	-	-0.001(-0.11)	0.147(1.51)	-	-
Constant	0.04(2.68)***	0.002(-0.13)	0.009(0.44)	-0.062(-1.38)	-	-

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 32 presents the situation in the Agriculture sector. Results in scenario 1 show that the noise will be removed at each short run in such a way that in the long-run there will be a stable relationship. More specifically, the error will be reduced by 2.07 each year. The table also shows that the current level of employment in agriculture is negatively influenced by the previous year's level of employment in the same sector (Agriculture), the level of GVA in Agriculture and minimum wage on one hand. On the other hand, it is positively and significantly influenced by previous year's level of employment in non-Agriculture and by GVA non-Agriculture. In addition, scenario 2 and 4 show that among the sectors only Manufacturing and Administration significantly influenced negatively and positively respectively the current level of employment. The GVA of all the sub-sectors have significant effect (either positive or negative) on the current level of employment.

The current level of employment in the Agricultural sector is negatively influenced significantly by the last two years' level of employment in the Agricultural sector. The inter temporal elasticity of employment is -1.94, meaning that a one per cent change in the past two years' employment in the Agricultural sector results in 1.94 per cent change, in the opposite direction, in this year's level of employment in the Agricultural sector.

Similarly, the growth elasticity of employment with respect to Gross Value Added in the Agricultural sector is -0.13, and lagged by one year. This means that a one per cent change in Gross Value Added in Agriculture in the previous year results into an opposite change of 0.13 per cent in the current level of employment in the Agricultural sector.

Furthermore, the elasticity of employment in the Agricultural sector with respect to the non-Agricultural Gross Value Added is 0.39, positive and has a lag of 2 years. This means, a one per cent change in the level of Gross Value Added in the non-Agricultural sector in the prior 2 years is accompanied by a change, in the same direction, of 0.39 per cent in current year's employment in the Agricultural sector.

Another significant relationship is that between minimum wage and employment in the Agricultural sector, which has a coefficient of -0.023 and lagged by one year. This implies that a one per cent change in the minimum wage of the previous year is accompanied by a change, in the employment level, in the opposite direction, of 0.023 per cent. See table 32.

Agribusiness value chains and the challenge of Job creation.

Although the numerical (31,241,000) and proportional (53.5%) employment contribution of the agricultural sector remain important as at 2014 (see Tables 4 and 5 respectively), during the period

studied, the proportional contribution had declined from 68.3% in 1981. It was, therefore, not surprising that the employment elasticity was negative at -0.13 (see Table 31). This implies that output growth in the agricultural sector during the period was achieved through productivity increases rather than by the employment of more persons. However, given the historical, potential, and relative size (23% of GDP as at 2014 as indicated in Table 4) of the agricultural sector, it is expected to lead economic development and job creation in Nigeria. Unfortunately, this challenge has been hindered by economies external to the sector.

The effect of the external economies [importation of food (like rice) and agribusiness raw materials (like wheat, and juice concentrates) and the exportation of unprocessed farm produce like cocoa beans] on domestic employment generation in the agribusiness value chain is reduced domestic employment generation.

However, this can be reversed by tackling the following challenges currently facing the sector:

1) Inconsistent government policy, particularly, in the areas of backward integration and import substitution.

2) Inconsistent government policy on forward integration and value added exports.

3) The development of inter-linkages and Agricultural value chains is still poor. When fully developed, secondary products will constitute demand pull for primary products, leading to the creation of more jobs along the value chains.

4) Dumping of imported subsidised agricultural (foreign agricultural over-production) resulting in unfair competition with domestic producers operating under harsh and unsubsidised conditions.

5) Under-invoicing of agricultural imports which throws local producers out of competition even when and where appropriate import tariffs have been instituted.

6) Local content development in the agribusiness value chain is still at policy level, unlike in the oil and gas sector where it is already legislated into enforceable/justiciable law. Enforceable legislation is the key to the success that the local content initiative has achieved in the oil and gas sector.

The Nigerian Content Development and Monitoring Board in the oil and gas sector is doing well in promoting the employment of indigenous men and materials by:

1) generally promoting the development and utilization of in-country capacities (facilities and human resources);

2) enhancing the quality of Nigerian jobs in the oil and gas industry through training and certification of indigenous human resources; and,

3) integrating the oil and gas communities into the oil and gas value chain. This support a suggestion for out-grower schemes around private sector agricultural plantations that are now coming up.

These should be replicated in the agribusiness sector and be made specific along value chains for effectiveness. A few cases can be considered , for example.

Fruit juice value chain

The fruit juice value chain belongs to the Food and Beverages sub-sector of the agricultural sector in Nigeria. There are over 100 (one hundred) participants in the organised private segment of this group, with a total annual group output of about N200 billion. The fruit juices sub-group's annual output of about N100 billion is produced mainly from tropical fruits.

Current capacity utilisation of the sub-group is between 35% - 40%. It sources about 40% of its raw materials locally, with own farm output accounting for about 50% of that. Though local yield per hectare is low compared to what obtains in their major import source (country of origin) of agricultural raw materials, mechanised out-grower scheme will enhance local content program and provide jobs locally.

The major challenges to 100% local content are: high interest rates charged on loans by commercial banks; multiple taxes by the three tiers of governments; low level of mechanisation of farming; zero or low percentage subsidy on farm equipment importation; logistic problems (e.g. few good roads and ineffective rail transport system) which make many local producers in the hinterland inaccessible, leading to high post-harvest losses of fresh fruits.

To address the current challenges, government policies should, generally, encourage farming; multiple taxes should be reviewed; mechanised farming should be encouraged by both private sector and government; and, government should build a network of good roads and rail system.

Cocoa value chain

There are 10 (ten) local operators in the cocoa grinding and processing product group. Their combined installed capacity can process more than the entire output of cocoa beans from Nigeria into all the products range, including chocolate, if the business environment is friendly.

Unfortunately, however, 3 (three) of the ten companies are currently closed due to harsh business operating environment, including but not limited to: high cost of finance; and, high cost of raw materials aggravated by cut-throat competition from exporters of raw cocoa beans.

To encourage local processing, value-added export and domesticate the job opportunities in cocoa processing, government should:

(a) facilitate borrowing at much friendly rates of interest; and,

(b) impose export tax on the exportation of raw cocoa beans to encourage local processing.

Sugarcane value chain

In the sugarcane value chain, about 5,000 farmers (increasing to 6,500 in 2015) were involved in sugarcane cultivation in 2014, producing 100,000 metric tonnes of raw sugar (or about 6.9%) of the total national requirement of 1,450,000 metric tonnes of raw sugar in 2014.

The implication of this is that about 66,429 (about 93.1%) of potential agricultural jobs have been externalised or exported. Apart from import tariff increases on raw sugar import, local production would be enhanced by the encouragement out-grower schemes around existing irrigated mechanised plantations and the establishment of new plantations and out-grower schemes.

Vegetable oil value chain

In the vegetable oil value chain, the story is not too different. Estimated domestic demand for vegetable oil was about 1,700,000 metric tonnes per annum in 2014, while total local production from all sources were: (a) palm oil, 1,000,000 metric tonnes produced by 390,000 farmers; (b) ground nut oil, 200,000 metric tonnes, supplied by 40,000 farmers; and, (c) soybean oil, 100,000 metric tonnes produced by 10,000 farmers.

From the above, about 440,000 farmers were involved in the production of vegetable oil in 2014, although there are possibilities that they engaged in mixed cropping and or mixed farming. This suggests, back-of-the-envelope, that a total of about 135,385 similar jobs were exported to the countries that supplied the gap in domestic demand. Consequently, provision of improved

seed/seedling varieties (for example earlier maturing, high yielding oil seed/seedling varieties), affordable, accessible, and appropriate farm credit, plantation farming, mechanised production and processing, stable policy, among many others, will improve local production. Land use reforms that make land available to intending young farmers and encourage mechanised plantation farming will also encourage local production and generate employment.

In sum, policy makers should collaborate more with private sector product groups (cooperatives, trade associations, etc.) to resolve all obstacles militating against job creation. Value chain specific reforms should be implemented to remove entry barriers (access to land, credit, access to raw materials, guaranteed and remunerative market, technology, etc.) for new and young farmers in particular. Government should ensure policy consistency in banning, unbanning, tariff, etc. Policies and regulations on local content development in the agricultural sector should be legislated, monitored and enforced. In addition to creating and retaining jobs in Nigeria, better quality jobs will arise from value addition, processing, and marketing.

Tables 33: Employment in mining and quarrying sector

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6
	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)
Ce1	-	0.037(0.52)	-1.911(-0.7)	0.081(0.21)	-	-0.138(-1.02)
Ce2	-	0.038(0.48)	-1.395(-0.67)	1.096(3.99)***	-	0.03(1.31)
Ce3	-	-0.114(-1.57)	0.413(1.81)*	-1.624(-2.62)***	-	0.173(0.61)
Ce4	-	0.056(0.36)	-	-	-	-
Ce5	-	-0.065(-1.00)	-	-	-	-
Employment Agriculture(-1)	-	0.433(0.83)	1.969(1.31)	-	-	-0.013(-0.03)
Employment Agriculture(-2)	-	0.824(1.15)	0.812(1.15)	-	-	-0.563(0.1)
Employment Mining(-1)	-	0.096(0.16)	-0.603(-0.88)	-	-	0.159(0.27)
Employment Mining(-2)	-	1.391(2)**	-0.267(-0.41)	-	-	0.305(0.64)
Employment Manufacturing (-1)	-	0.428(1.53)	-1.07(-1.59)	-	-	0.475(1.49)
Employment Manufacturing (-2)	-	0.268(0.89)	-0.206(-0.50)	-	-	-0.321(-0.8)
Employment Construction(-1)	-	0.198(0.25)	-1.606(-0.94)	-	-	0.62(0.93)
Employment Construction(-2)	-	-0.750(-1.07)	-0.01(-0.01)	-	-	-0.392(-0.75)
Employment Admin(-1)	-	0.155(0.23)	0.708(0.96)	-	-	-0.579(-1.02)
Employment Admin(-2)	-	1.272(1.91)*	0.151(0.2)	-	-	0.743(1.37)
Employment Trade	-	-	-	-	-	-
Employment Non-agric(-1)	-	-	-	-	-	-
Employment Non-agric(-2)	-	-	-	-	-	-
GVA Agriculture(-1)	-	0.022(0.41)	-	-0.891(-2.73)***	-	0.039(0.43)
GVA Agriculture(-2)	-	-0.104(-1.69)*	-	-0.285(-1.12)	-	0.05(0.71)
GVA Mining(-1)	-	0.009(0.09)*	-	-0.069(-0.18)	-	-0.154(-2.2)**
GVA Mining(-2)	-	-0.043(-0.73)	-	0.206(0.77)	-	-0.064(-0.88)
GVA Manufacturing (-1)	-	-0.062(-1.04)	-	1.241(2.67)***	-	0.064(1.79)
GVA Manufacturing (-2)	-	-0.076(-1.26)	-	0.566(2.87)***	-	0.029(0.96)
GVA Construction(-1)	-	0.068(1.49)	-	-0.166(-0.8)	-	0.042(0.55)
GVA Construction (-2)	-	-0.102(-1.2)	-	-0.447(-1.99) **	-	0.079(1.8)
GVA Admin (-1)	-	-0.292(-1.04)	-	0.909(1.63)	-	0.152(0.54)
GVA Admin (-2)	-	-0.234(-1.27)	-	0.571(0.87)	-	-0.025(-0.1)
GVA Trade	-	-	-	-	-	-
GVA Non-agric (-1)	-	-	-	-	-	-
GVA Non-agric (-2)	-	-	-	-	-	-
GDP (-1)	-	-	-	-	-	-
GDP (-2)	-	-	-	-	-	-
Inflation Rate(-1)	-	-	-0.004(-0.51)	0.0002(0.01)	-	-0.007(-1.22)
Inflation Rate(-2)	-	-	-0.002(-0.46)	0.007(0.36)	-	-0.008(-1.36)
WAPLR(Weighted Average Prime Lending Rate)(-1)	-	-	-0.018(-0.65)	-0.468(-2.82)***	-	-
WAPLR(Weighted Average Prime Lending Rate)(-2)	-	-	-0.002(-0.11)	-0.166(-1.65)	-	-
Minimum wage (-1)	-	-	-0.009(-1.79)*	0.07(1.49)	-	-
Minimum wage (-2)	-	-	-0.006(-0.99)	-0.021(-0.60)	-	-
Constant	-	0.012(0.53)	-0.016(-1.21)	-0.01(-0.21)	-	-0.011(-0.98)

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 33 presents the situation in the Mining and quarrying sector. Only scenario 4 is the most plausible one as it is the only one where the error will continuously be reduced over the years. Results show that the noise will be removed at each short run in such a way that in the long-run there will be a stable relationship. More specifically, the error will be reduced by 1.6 each year. The table shows that apart from GVA Mining and Administration, the lagged value of the GVA of all other sectors significantly explain the current level of employment in the Mining and Quarrying sector either negatively or positively. In addition, the previous year's Weighted Average Prime Lending Rate also significantly influenced negatively the current level of employment in Mining.

Current employment level in the Mining sector is significantly influenced by the immediate past Gross Value Added in Agricultural sector. More specifically, the growth elasticity of employment in the Mining sector with respect to Gross Value Added in Agriculture is -0.891 and lagged by one year. This means that one percent change in Gross Value Added in Agriculture in the immediate past year is accompanied by a 0.891 per cent change in the employment level this year in the Mining sector in the opposite direction.

Also, current employment in the Mining sector of the Nigerian economy is significantly influenced by the Gross Value Added of the previous year in the Manufacturing sector. Specifically, the employment intensity of growth in the Mining sector with respect to Gross Value Added in the Manufacturing sector of the economy is 1.241, positive and lagged by one year. This means, a one per cent change in the level of Manufacturing Gross Value Added of the immediate past year is accompanied by a 1.241 per cent change in employment in the Mining sector in the same direction.

Furthermore, current employment in the Mining sector of the Nigerian economy in the period under review is significantly influenced by two-year lagged Gross Value Added in the Construction sector. The employment intensity of growth in the Mining sector with respect to Gross Value Added in the Construction sector is -0.447 and lagged by two years. In other words, a one per cent change in prior two years' Gross Value Added in the Construction sector is accompanied by a 0.447 per cent change, in the opposite direction, in employment in the current year in the Mining sector.

In addition, employment in the Mining sector of the economy is significantly affected by the Weighted Average Prime Lending Rate (WAPLR) of the immediate past year. In specific terms, the intensity or coefficient is -0.468. This implies that a one per cent change in the previous year's

WAPLR is associated with a 0.468 per cent change, in the opposite direction, in employment level in the Mining sector of the Nigerian economy. See table 33

Tables 34: Employment in manufacturing sector

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6
	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)
Ce1	-	0.306(0.83)	-2.626(-0.12)**	0.834(1.75)	-	-0.101(-0.27)
Ce2	-	0.329(0.8)	20.739(2.45)**	0.067(0.2)	-	-0.03(-0.46)
Ce3	-	-0.185(-0.49)	-2.233(-2.40)**	-1.127(-`.49)	-	0.44(0.55)
Ce4	-	0.609(0.75)	-	-	-	-
Ce5	-	-0.199(-0.59)	-	-	-	-
Employment Agriculture(-1)	-	0.74(0.27)	-11.133(-1.82)*	-	-	2.361(1.71)
Employment Agriculture(-2)	-	3.17(0.85)	0.300(0.10)	-	-	1.594(1.66)
Employment Mining(-1)	-	-3.370(-1.06)	5.134(1.83)*	-	-	0.453(0.28)
Employment Mining(-2)	-	-2.999(-0.83)	2.441(0.92)	-	-	-4.498(-3.37)***
Employment Manufacturing (-1)	-	-2.331(-1.61)	-3.337(-1.22)	-	-	-2.521(-2.83)***
Employment Manufacturing (-2)	-	-1.436(-0.92)	-3.044(-1.79)*	-	-	-0.4(-0.36)
Employment Construction(-1)	-	-1.181(-0.29)	-15.197(-2.20)**	-	-	-2.914(-1.56)
Employment Construction(-2)	-	-1.003(-0.28)	-7.667(-1.54)	-	-	1.983(1.36)
Employment Admin(-1)	-	0.136(0.04)	5.259(1.76)*	-	-	3.304(2.08)**
Employment Admin(-2)	-	1.243(0.36)	5.378(1.71)*	-	-	-2.390(-1.58)
Employment Trade	-	-	-	-	-	-
Employment Non-agric(-1)	-	-	-	-	-	-
Employment Non-agric(-2)	-	-	-	-	-	-
GVA Agriculture(-1)	-	-0.151(-0.53)	-	0.249(0.62)	-	-0.501(-1.94)*
GVA Agriculture(-2)	-	-0.275(-0.86)	-	-0.252(-0.81)	-	0.011(0.06)
GVA Mining(-1)	-	0.549(1.09)	-	1.352(2.94)***	-	0.228(1.16)
GVA Mining(-2)	-	0.317(1.03)	-	0.712(2.18)**	-	0.446(2.17)**
GVA Manufacturing (-1)	-	-0.109(-0.35)	-	-1.197(-2.11)**	-	-0.110(-1.1)
GVA Manufacturing (-2)	-	-0.090(-0.29)	-	-1.036(-4.28)***	-	-0.014(-0.17)
GVA Construction(-1)	-	0.010(0.04)	-	0.334(1.31)	-	-0.3 (-1.38)
GVA Construction (-2)	-	-0.379(-0.86)	-	-0.241(-0.88)	-	-0.061(-0.5)
GVA Admin (-1)	-	1.107(0.76)	-	-0.723(-1.06)	-	1.01 (1.28)
GVA Admin (-2)	-	1.039(1.09)	-	0.605(0.76)	-	1.473(2.11)
GVA Trade	-	-	-	-	-	-
GVA Non-agric(-1)	-	-	-	-	-	-
GVA Non-agric (-2)	-	-	-	-	-	-
GDP (-1)	-	-	-	-	-	-
GDP (-2)	-	-	-	-	-	-
Inflation Rate(-1)	-	-	-0.060(-1.90)*	0.053(2.14)**	-	0.00634(0.36)
Inflation Rate(-2)	-	-	-0.002(-0.12)	0.029(1.11)	-	0.032(1.81)
WAPLR(Weighted Average Prime Lending Rate)(-1)	-	-	-0.270(-2.32)**	0.099(0.5)	-	-
WAPLR(Weighted Average Prime Lending Rate)(-2)	-	-	-0.184(-2.13)**	-0.063(-0.52)	-	-
Minimum wage (-1)	-	-	-0.007(-0.36)	-0.149(-2.6)***	-	-
Minimum wage (-2)	-	-	0.0002(0.01)	-0.08(-1.84)	-	-
Constant	-	-0.050(-0.41)	-0.043(-0.78)	0.096(1.62)	-	0.004(0.14)

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 34 presents the situation in the Manufacturing sector. Only scenario 3 is the most plausible one as it is the only one where the error will continuously be reduced over the years. Results show that the noise will be removed at each short run in such a way that in the long-run there will be a stable relationship. More specifically, the error will be reduced by more than 2 each year. The table shows that employment in manufacturing is negatively affected by the level of employment in others sectors except Mining and Administration. In addition, Inflation and Weighted Average Prime Lending Rate also significantly influence negatively the current level of employment in Manufacturing.

Manufacturing sector

Employment in the Manufacturing sector is influenced significantly by the immediate past year's employment level in Agriculture. The coefficient of intensity is -11.133 and lagged by one year. This implies that a one per cent change in the immediate past year's employment in Agriculture is associated with 11.133 per cent change, in the opposite direction, in employment in the Manufacturing sector.

Employment in the Manufacturing sector is also influenced significantly by the immediate past year's employment in the Mining sector. Specifically, the employment intensity of growth in the Manufacturing sector with respect to employment in the Mining sector is 5.134 lagged by one year. This means that a one per cent change in the level of employment in the immediate past year in the Mining sector is accompanied by a 5.134 per cent change, in the same direction, in employment in the Manufacturing sector.

Furthermore, the current level of employment in the Manufacturing sector is significantly affected by the last two years' employment in that sector. The inter-temporal employment intensity of growth in the Manufacturing sector is -3.044 with a lag of two year. This means that a one per cent change in the level of employment of the past two years in the Manufacturing sector results in a change in the current year employment level by 3.044 per cent, in the opposite direction, in the same (Manufacturing) sector.

Also, current employment level in the Manufacturing sector is influenced significantly by previous year's employment in the Construction sector of the Nigerian Economy. The employment intensity of growth in the Manufacturing sector with respect to employment in the Construction sector is -15.197 lagged by a year. By implication, a one per cent change in last year's employment in the

Construction sector of the economy, during the period under review, is accompanied by a 15.197 per cent employment change, in the opposite direction, in the Manufacturing sector.

Furthermore, the current employment level in the Manufacturing sector is significantly influenced by the immediate past year's employment in Administration. The employment intensity of growth in the Manufacturing sector with respect to employment in the Administration sector of the economy is 5.259 lagged by one year. This means a one per cent change in the immediate past year's employment in the Administration sector is accompanied by a 5.259 per cent change, in the same direction, in employment in the Manufacturing sector of the Nigerian economy during the period under review. See table 34.

Table 35: Employment in construction sector

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6
	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)
Ce1	-	0.079(0.74)	2.136(0.79)	0.790(2.94)***	-	-0.208(-1.26)
Ce2	-	0.108(0.92)	-2.761(-1.34)	-0.104(-0.55)	-	0.04(1.4)
Ce3	-	-0.153(-1.41)	0.372(1.67)	-0.194(-0.45)	-	0.308(0.89)
Ce4	-	0.234(1.01)	-	-	-	-
Ce5	-	-0.160(-1.65)	-	-	-	-
Employment Agriculture(-1)	-	0.483(0.62)	1.473(0.99)	-	-	0.163(0.27)
Employment Agriculture(-2)	-	0.784(0.73)	-0.058(-0.08)	-	-	-0.620(-1.49)
Employment Mining(-1)	-	0.874(0.95)	-0.188(-0.28)	-	-	0.866(1.22)
Employment Mining(-2)	-	2.049(1.98)**	-0.610(-0.95)	-	-	0.898(1.55)
Employment Manufacturing (-1)	-	0.054(0.13)	0.273(0.41)	-	-	0.155(0.4)
Employment Manufacturing (-2)	-	-0.09(-0.22)	0.561(1.36)	-	-	-0.42(-0.86)
Employment Construction(-1)	-	-0.197(-0.17)	1.682(1)	-	-	0.225(0.28)
Employment Construction(-2)	-	-1.280(-1.22)	0.959(0.79)	-	-	-0.734(-1.15)
Employment Admin(-1)	-	0.119(0.12)	-0.192(-0.26)	-	-	-0.422(-0.61)
Employment Admin(-2)	-	1.767(1.78)	-0.374(-0.49)	-	-	0.976(1.01)
Employment Trade	-	-	-	-	-	-
Employment Non-agric(-1)	-	-	-	-	-	-
Employment Non-agric(-2)	-	-	-	-	-	-
GVA Agriculture(-1)	-	0.099(1.21)	-	-0.188(-0.83)	-	0.125(1.12)
GVA Agriculture(-2)	-	-0.018(-0.19)	-	-0.29(-1.65)	-	0.087(1.01)
GVA Mining(-1)	-	0.053(0.37)	-	0.095(0.37)	-	-0.096(-1.13)
GVA Mining(-2)	-	-0.028(-0.32)	-	0.051(0.28)	-	-0.05(-0.56)
GVA Manufacturing (-1)	-	-0.057(-0.64)	-	-0.227(-0.71)	-	0.037(0.86)
GVA Manufacturing (-2)	-	-0.106(-1.19)	-	0.203(1.49)	-	0.006(0.16)
GVA Construction(-1)	-	0.079(1.16)	-	-0.137(-0.96)	-	0.058(0.61)
GVA Construction (-2)	-	-0.153(-1.21)	-	-0.007(-0.05)	-	0.059(1.1)
GVA Admin (-1)	-	0.021(0.05)	-	1.153(2.99)***	-	0.081(0.24)
GVA Admin (-2)	-	-0.095(-0.35)	-	0.814(1.80)	-	-0.066(-0.22)
GVA Trade	-	-	-	-	-	-
GVA Non-agric(-1)	-	-	-	-	-	-
GVA Non-agric (-2)	-	-	-	-	-	-
GDP (-1)	-	-	-	-	-	-
GDP (-2)	-	-	-	-	-	-
Inflation Rate(-1)	-	-	0.006(-0.78)	0.006(0.49)	-	-0.008(-1.03)
Inflation Rate(-2)	-	-	0.002(0.59)	-0.009(-0.62)	-	-0.009(-1.19)
WAPLR(Weighted Average Prime Lending Rate)(-1)	-	-	0.022(0.79)	0.055(0.48)	-	-
WAPLR(Weighted Average Prime Lending Rate)(-2)	-	-	0.02(0.97)	0.069(0.99)	-	-
Minimum wage (-1)	-	-	-0.015(-2.98)***	-0.029(-0.92)	-	-
Minimum wage (-2)	-	-	-0.0007(-0.11)	-0.010(-0.43)	-	-
Constant	-	0.031(0.89)	0.009(0.73)	-0.025(-0.75)	-	-0.007(-0.53)

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 35 presents the situation in the Construction sector. There is no plausible scenario where the error will continuously be reduced over the years. Consequently, the results, as shown cannot be relied upon for policy making.

Table 36: Employment in administration and social services sector

	Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6
	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)	Coef.(z)
Ce1	-	0.308(2.08)**	-6.349(-1.31)	-0.302(-1.04)	-	-0.241(-0.98)
Ce2	-	0.359(2.18)**	5.077(1.38)	-0.21(-1.02)	-	0.039(0.93)
Ce3	-	-0.304(-2.02)**	-0.425(-1.05)	0.465(1)	-	0.401(0.78)
Ce4	-	0.702(2.17)**	-	-	-	-
Ce5	-	-0.332(-2.46)**	-	-	-	-
Employment Agriculture(-1)	-	0.344(0.32)	-3.294(-1.24)	-	-	1.236(1.39)
Employment Agriculture(-2)	-	2.584(1.73)*	-0.221(-0.18)	-	-	0.841(1.36)
Employment Mining(-1)	-	-1.045(-0.82)	0.887(0.73)	-	-	0.757(0.72)
Employment Mining(-2)	-	0.444(0.31)	-0.343(-0.3)	-	-	-0.349(-0.41)
Employment Manufacturing (-1)	-	-1.194(-2.05)**	-0.6(-0.5)	-	-	-1.195(-2.08)**
Employment Manufacturing (-2)	-	-1.112(-0.76)	-0.292(-0.40)	-	-	-0.86(-1.19)
Employment Construction(-1)	-	0.027(0.02)	-2.3(-0.77)	-	-	-1.177(-0.98)
Employment Construction(-2)	-	-1.112(-0.76)	-0.874(-0.40)	-	-	-0.484(-0.51)
Employment Admin(-1)	-	-0.796(-0.57)	0.573(0.44)	-	-	0.790(0.77)
Employment Admin(-2)	-	1.742(1.26)	0.694(0.51)	-	-	0.44(0.45)
Employment Trade	-	-	-	-	-	-
Employment Non-agric(-1)	-	-	-	-	-	-
Employment Non-agric(-2)	-	-	-	-	-	-
GVA Agriculture(-1)	-	-0.007(-0.07)	-	0.101(0.42)	-	0.014(0.09)
GVA Agriculture(-2)	-	-0.098(-0.77)	-	0.249(1.31)	-	0.072(0.56)
GVA Mining(-1)	-	0.423(2.09)**	-	-0.076(-0.27)	-	-0.046(-0.37)
GVA Mining(-2)	-	0.216(1.75)	-	-0.162(-0.81)	-	0.091(0.69)
GVA Manufacturing (-1)	-	-0.133(-1.07)	-	0.028(0.8)	-	0.011(0.18)
GVA Manufacturing (-2)	-	-0.190(-1.52)	-	-0.034(-0.23)	-	0.039(0.71)
GVA Construction(-1)	-	0.077(0.81)	-	0.09 (0.58)	-	-0.023(-0.17)
GVA Construction (-2)	-	-0.396(-2.24) **	-	0.227(1.35)	-	0.046(0.58)
GVA Admin (-1)	-	0.695(1.19)	-	-0.112(-0.27)	-	0.194(0.38)
GVA Admin (-2)	-	0.496(1.29)	-	-0.594(-1.21)	-	0.285(0.63)
GVA Trade	-	-	-	-	-	-
GVA Non-agric(-1)	-	-	-	-	-	-
GVA Non-agric (-2)	-	-	-	-	-	-
GDP (-1)	-	-	-	-	-	-
GDP (-2)	-	-	-	-	-	-
Inflation Rate(-1)	-	-	-0.02(-1.47)	-0.004(-0.32)	-	-0.009(-0.87)
Inflation Rate(-2)	-	-	-0.005(-0.67)	-0.011(-0.71)	-	0.0005(0.05)
WAPLR(Weighted Average Prime Lending Rate)(-1)	-	-	-0.047(-0.94)	0.086(0.69)	-	-
WAPLR(Weighted Average Prime Lending Rate)(-2)	-	-	-0.024(-0.65)	0.031(0.42)	-	-
Minimum wage (-1)	-	-	-0.025(-2.77)***	-0.023(-0.67)	-	-
Minimum wage (-2)	-	-	-0.005(-0.45)	0.015(0.59)	-	-
Constant	-	-0.027(-0.57)	0.013(0.57)	0.089(2.46)**	-	0.001(0.06)

Source: Author's Analysis of Data collected from the National Bureau of Statistics

Table 36 presents the situation in the Administration sector. Scenario 2 is the most plausible as it is the only one where the error will continuously be reduced over the years. Results show that the noise will be removed at each short run in such a way that in the long-run there will be a stable relationship. More specifically, the error will be reduced by more than 0.3 each year. The table shows that the current level of employment in Administration is negatively influenced by the previous year's level of employment in the Manufacturing sector, and GVA Construction lagged by two years, while it is positively influenced by the lagged level of employment in Agriculture and one-year lagged GVA in Mining.

Employment in the Administration sector of the Nigerian economy during the period under review is significantly and positively influenced by the level of employment of the past two years in the Agricultural sector of the economy. Specifically, the employment intensity of growth in the Administration sector with respect to employment in the Agricultural sector is 2.584, lagged by two years. This implies that a one per cent change in the level of employment in the Agricultural sector two prior years is associated with a 2.584 per cent change, in the same direction, in the current level of employment in the Administration sector.

The current level of employment in the Administration sector is also significantly influenced by the immediate past year's employment in the Manufacturing sector. The employment intensity of growth in the Administration sector with respect to prior year's employment in the Manufacturing sector is -1.194. This means that a one per cent change in the employment level of the immediate past year in the Manufacturing sector is accompanied by a 1.194 per cent change, in the opposite direction, in employment in the Administration sector of the economy.

Furthermore, the current level of employment in the Administration sector is significantly and positively influenced by one-year lagged level of Gross Value Added in Mining, The employment intensity of growth in the Administration sector with respect to one-year lagged level of Gross Value Added in the Mining sector is 0.423 and positive. This means, a one per cent change in the level of the immediate past year's Gross Value Added in Mining sector of the economy is accompanied a 0.423 per cent change, in the same direction, in employment in the Administration sector of the economy.

Also, employment in the Administration sector of the economy is significantly influenced by the level of Gross Value Added in the Construction sector, lagged by two years. The employment intensity of growth in the Administration sector with respect to Gross Value Added in the Construction sector is -0.396. This means that a one per cent change in the previous two years'

Gross Value Added in Construction is accompanied by 0.396 percent change, in the opposite direction, in the employment level of the Administration sector. See table 36.

4.4 Factors that affected employment during the growth period of 1981-2014 and framework for employment-growth targeting in Nigeria

4.4.1: Factors that affected employment during the growth period of 1981-2014

Arising from the above analysis, the factors that affected employment in Nigeria during the growth period of 1981-2014 under review are as follows:-

GDP / GVA

Though not significantly so, GDP growth was positively correlated to aggregate employment. However, GVA, in particular sectors were significantly correlated to sectoral employment, either negatively or positively depending on inter-sectoral influences as follows:

(a) Two-year lagged GVA in non-Agricultural sector was significantly positively correlated in generating employment in the Agricultural sector.

(b) One-year lagged GVA in the Manufacturing sector was significantly positively correlated to employment generation in the Mining and Quarrying sector.

(c) One-year lagged GVA in the Agricultural sector was significantly negatively correlated to generating employment in the Mining and Quarrying sector.

(d) Two-year lagged GVA in the Construction sector was significantly negatively correlated in generating employment in the Mining and Quarrying sector.

(e) One-year lagged sectoral output (GVA) in the Mining and Quarrying sector was significantly positively correlated to employment in the Administration and Social Services sector.

(f) Prior-year's sectoral output (GVA) in construction was significantly negatively correlated to employment in the Administration and Social Services sector.

Wage rate

Though not significant at aggregate levels, wage rate was negatively correlated to employment. However, at sectoral levels, wage rate was significantly and negatively correlated with employment in Agriculture, where employment in Agriculture sector moved in opposite direction to previous year's wage rate.

Interest rate

Just like wage rate, interest rate moved in opposite direction to aggregate employment in the economy during the period under review, but the relationship was not significant. However, it was significant in the Manufacturing, and Mining and Quarrying sectors, where employment moved in opposite directions to one-year lagged interest rates.

Inflation rate

Also, at the aggregate level, inflation is not a significant negative correlate of employment in the Nigerian economy during the growth period between 1981 and 2014. However, it was significant in the Manufacturing sector, where employment was negatively correlated to one-year lagged rate of inflation

4.4.2: Framework for employment-growth targeting in Nigeria

A beauty of the Vector Error Correction Model analysis is that it enables a simultaneous modeling and analysis of all the sectors of the economy at the same time. This is similar to the real working of the economy, whereby all the sectors are at work at the same time to produce a unique set of economic outcomes like growth and employment.

Consequently, and following from the above analysis, the study attempted to construct a framework for Employment-Growth targeting as per table 37 below:-

Table 37: Framework for employment-growth targeting

AGRICULTURAL SECTOR	MINING AND QUARRYING SECTOR
Positive (+) 1. Two-year lagged employment in non-agric sectors. 2. Two-year lagged GVA in non-agric sectors 3. Constant factor (only significant constant which is also positive). Negative (-) 1. Two-year lagged employment in agric 2. One-year lagged Agricultural output (GVA_Agric-1) 3. Previous years wage rate.	Positive (+) 1. One-year lagged GVA in the manufacturing sector. Negative (-) 1. One-year lagged GVA in the Agricultural sector. 2. Two-year lagged GVA in the construction sector. 3. One-year lagged weighted average prime lending rate.
MANUFACTURING SECTOR	ADMINISTRATION SECTOR
Positive (+) 1. One-year lagged employment in administration 2. One-year lagged employment in mining. Negative (-) 1. One-year lagged employment in agriculture. 2. Two-year lagged employment in manufacturing 3. One-year lagged employment in construction 4. One-year lagged rate of inflation. 5. One-year lagged weighted average prime lending rate.	Positive (+) 1. Two-year lagged employment in agriculture 2. One-year lagged sectoral output in mining (GVA mining). Negative (-) 1. Last year's level of employment in manufacturing. 2. Last year's sectoral output in construction (GVA construction).

Source: Author's Analysis of Data collected from the National Bureau of Statistics

The above table paints a one pager dashboard which can be used to target employment or unemployment in the economy. In Nigeria, as in most African countries, we do not target unemployment or employment rate. Instead, governments expect unemployment to "reduce" as a by-product of some uncoordinated economic decisions in their annual budgets and Medium Term Expenditure Frameworks (MTEFs) unlike some other macroeconomic variables, such as average exchange rate, average inflation rate, and GDP growth rate.

Employment or underemployment issue should be kept in permanent focus, particularly, as it has become a prominent socio-economic malaise. Furthermore, in Nigeria, there is the need to achieve inclusive and sustainable balance economic growth in the wake of the strong desire to diversify the productive base economy.

The above table indicates that growth-employment targeting is not a short-term exercise. It is a complex, intertwined, inter-sectoral, and inter-temporal exercise, involving the interplay of many economic variables to produce an employment outcome. It requires medium to long-term planning and process. As can be seen in the table, employment in the current year is a product of a process that started two years before.

The framework indicates that employment in agriculture is positively influenced by two-year lagged employment in the non-agric sectors; two-year lagged GVA in non-agric sectors; and, negatively influenced by two-year lagged employment in agric; one-year lagged agricultural output (GVA_Agric-1); and, the previous year's wage rate. This explains the backward and the forward linkages of the agricultural sector to the other sectors of the economy through input procurement, output processing and marketing. Furthermore, production and employment expansion in the other (non-agricultural) sectors of the economy lead to improved household income and demand for food and other agricultural products which creates more opportunity for agricultural employment. It also explains the age-long conjecture of vicious cycle of production in the largely peasant agricultural sector, whereby farmers react to their prior year(s) experience on farm labour (and other input) prices, overproduction and price depression in taking current year's production (and input procurement) decisions.

Similarly, employment in the manufacturing sector is positively influenced by one-year lagged employment in administration and social services; and, one-year lagged employment in mining. On the other hand, it is negatively influenced by one-year lagged employment in agriculture; two-

year lagged employment in manufacturing; one-year lagged employment in construction; one-year lagged rate of inflation; and, one-year lagged weighted average prime lending rate. Increased employment in administration and social services; and, in mining and quarrying sectors all lagged by one year's reaction time will lead to increased employment in the manufacturing sector arising from increased demand for manufactured goods, which in turn encourages investors to employ more labour to meet expanded household demand. In contrast, one-year lagged employment in agriculture and construction sectors combined to limit employment in manufacturing, probably, due to competition in the labour market, and vice versa. Employment in the manufacturing sector, also moves in the opposite direction to prior two-year employment in the same sector, probably, due to inventory build-up and depletion cycles, and the reaction time.

Furthermore, one-year lagged inflation rate inversely influences manufacturing sector employment since inflation limits the budget constraint for the procurement of production raw materials and the number of labour hands required to convert them to finished goods. In the same manner, one-year lagged weighted average prime lending rate (WAPLR) inversely affects employment creation in the manufacturing sector, because rising interest rate is a disincentive to investors, which, in turn, limits industrial demand for labour. The converse is equally true. In addition, investors need a one-year reaction time to decide and adjust their plans to changes in interest rate.

In the mining and quarrying sector, one-year lagged GVA in the manufacturing sector positively influenced employment because the manufactured products from that sector, like vehicles, make use of fuel, while some other manufactured products are utilised in mining and quarrying. Furthermore, the output of mining and quarrying, like crude petroleum in oil refining, constitute input into manufacturing. There exists a very strong linkage between manufacturing, and mining and quarrying. On the other hand, one-year lagged GVA in the agricultural sector; two-year lagged GVA in the construction sector; and, one-year lagged weighted average prime lending rate (WAPLR) negatively influenced employment. The negative influence of the one-year lagged agriculture sectoral output and two-year lagged construction sectoral output may be due to labour mobility and labour market dynamics, particularly in artisanal mining. The negative influence of the one-year lagged WAPLR on employment in mining and quarrying is due to the capital-intensive (hence loan-intensive) nature of commercial mining and quarrying. Rising interest rate will lead to reduced investment and activities in the mining and quarrying sector, thereby limiting the numbers of persons employed. Also, investors need a one-year reaction time to decide and adjust their plans to changes in interest rate.

In the administration and social services sector, employment creation is positively influenced by two-year lagged employment in agriculture; and, one-year lagged sectoral output (GVA) in mining and quarrying. However, previous year's level of employment in manufacturing and previous year's sectoral output (GVA) in construction reduces employment in the administration and social services sector. Two-year lagged employment in agriculture is expected to lead to enhanced agricultural income. This, in turn, enhances the demand for health services, education and other social services which will necessitate the employment of more persons. One-year lagged sectoral output in mining and quarrying will also increase corporate and household income. This will, in turn, increase the demand for social services and employment in the administration and social services sector. In contrast, previous year's employment in the manufacturing sector limits the socially-induced employment in public service. Similarly, previous year's output in the construction sector enhances private sector employment and consequently dampens socially-induced employment.

There are two summary inferences derivable from the above framework, viz:-

(1) For balanced, diversified, and inclusive growth and commensurate employment generation in the Nigerian economy during the period under review, policy formulation should have taken into consideration the components of the above framework.

(2) For the economy to continue to grow at that expected rate trajectory and be accompanied by diversified, inclusive, and commensurate job creation, policy makers must simultaneously take into account the issues in the above framework, their interconnectedness and the balancing of same.

In conclusion, employment (or unemployment) rate targeting is a complex web of inter-temporal and inter-sectoral activities. Rigorous planning across all the sectors of the economy is required on a medium to long-term basis, taking into account the peculiarities of the various sectors as well as the sectoral linkages, the value chains and the various reaction times to changes in policy stimuli in all the sectors of the economy.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1: Summary of major findings

5.1.1: Pattern of unemployment

Unemployment has been on the ascendancy in Nigeria, coexisting with good economic growth performance between 1981 and 2014. It will seem as if the military dictators focused more on managing unemployment rather than managing inflation, while their civilian counterparts focused more on managing inflation going by the outcomes of both parameters under the different regime types. Despite the very laudable objectives of the Structural Adjustment Programme, its impact on the very important economic outcomes of unemployment and inflation is, at the least, not evident. During the post-SAP democratic dispensation, the Obasanjo administration (1999-2007) recorded a better unemployment rate outcome than the Yar'Adua/Jonathan administration (2007-2014) with inflation kept at about the same level.

A review of the transition of sectoral contribution to employment indicates that employment is transitioning from production in the real sectors of agriculture (crop production, livestock, forestry and fishing) and manufacturing (oil refining; cement; food, beverage, and tobacco; textile, apparel, and footwear; wood and wood products; pulp, paper and paper products; chemical and pharmaceutical products; non-metallic products; plastic and rubber products; electrical and electronics; basic metal, iron and steel; motor vehicles and assembly; and, other manufacturing – sub-sectors 9-21 in NBS, 2016 classification) to the Services sectors in Administration and Social Services (administrative and support services; public administration; education; human health and social services; and, other services – sub-sectors 42-46 in NBS, 2016 classification), and Trade and Services sectors (electricity, gas, steam, and air conditioning supply; water supply, sewerage, waste management, and remediation; trade; accommodation and food services; transportation and storage; information and communication; arts, entertainment and recreation; financial and insurance; real estate; and, professional, scientific and technical services – 22, 23, 25-41 in NBS, 2016 classification).

The Public sector (Administration and Social Services) has emerged as a major provider of employment. With its contribution to employment increasing from 26.2% in 1981 to 41.2% in 2014, it is playing catch-up with Agriculture whose contribution to employment has reduced from

68.3% in 1981 to 51.6% in 2014. This is not unexpected because of recent politically motivated employment in the public service.

5.1.2: Employment elasticity of aggregate growth

Aggregate Employment was positively correlated with GDP, with a coefficient of 0.21. However, the relationship was not significant. Statistically, it cannot be relied on for any meaningful interpretation or policy. What is known, however, is that economic growth was 'jobless' or not strong enough to generate commensurate employment during the period.

5.1.3: Sectoral elasticity of employment

Some economic sectors were relatively more employment responsive than others. The economic sectors with significant job creating capacities, according to the result of the analysis are: Agriculture, Mining and Quarrying, Manufacturing, and Administration and Social Services.

The contribution of agriculture to employment reduced from 68.3% in 1981 to 53.5% in 2014, while that of non-agriculture increased from 31.7% to 46.5% for the same period. However, agriculture still employed the greater number, contributing 31,241,000 of the aggregate employment of 58,369,000 in 2014. Agriculture sectoral elasticity of employment was -0.13, indicating that output growth in the sector, during the period, was achieved through productivity increases rather than the employment of more persons. In the non-agricultural sectors, except for construction, with significant elasticity of 0.12, the coefficients were low and not significant. The low, negative and insignificant coefficient of -0.05 for the mining sector, similarly, indicated that output growth in that sector was achieved through productivity increases only. Sectoral employment depended on GVA growth (agriculture β=-0.13; non-agriculture, β=0.39), wage rate (β=-0.023), interest rate (β=-0.011), inflation rate (β=-0.002), and the inter-temporal (t-x) and cross-sectoral relationships among economic sectors. Employment in agriculture depended on non-agricultural output (β=0.39) and non-agricultural employment (β=1.15) as well as previous year's wage rate (β=-0.023) in agriculture and previous year's agricultural output (β=-0.13). The GVA non-agriculture$_{t-2}$ (β=0.39) and employment in non-agriculture$_{t-2}$ (β=1.15) positively stimulated employment in agriculture, while employment in agriculture$_{t-2}$, (β=-1.94) GVA agriculture$_{t-1}$ (β=-0.13) and wage rate$_{t-1}$ (β=-0.023) limit current year's agricultural employment.

5.1.4: Factors that affected employment during the growth period between 1981 and 2014, and framework for employment-growth targeting.

The result of the analysis indicate that GDP is an insignificant positive correlate, while wage rate, interest rate, and inflation rate are insignificant negative correlates of aggregate employment during the period. However, GVA, interest rate, wage rate, and inflation rate were significant influencers of sectoral employment, with individual peculiarities.

Arising from the significant job creating capacities of the various sectors of the economy and their interdependencies, a framework for Employment-Growth targeting was constructed. This is expected to deliver diversified and inclusive employment commensurate with diversified and inclusive growth.

5.2: Conclusion

(1) Despite the good economic growth outcomes recorded by Nigeria during the period under review, unemployment was very high and rising consistently. It was higher during the civilian regimes than during military dictatorship. In the democratic dispensation, it was higher under the Yar'Adua/Jonathan administration than under Obasanjo's. Furthermore, there was evidence of employment transition from production sectors to services sectors of the economy, with transition disproportionately in favour of public sector.

(2) Economic growth in Nigeria did not create commensurate employment during the period. The insignificant elasticity coefficient, though indicates that the result could not be relied upon for any meaningful policy, may also suggest that the employment generating ability (employment intensity) of growth was weak in Nigeria during the period.

(3) The sectoral employment elasticities of gross value added estimated for the main activity sectors of the economy enabled us to identify the employment intensive sectors and their dependencies that can enable us to optimise the job creating capacities of the sectors.

(4) Furthermore, we were able to identify the factors which affected employment creation during the period and to construct a framework for Employment-Growth targeting. This will assist policy makers to plan for inclusive growth laden with high employment generating capacity.

In sum, the Gross Domestic Product and the Gross Value Added growth both affected agricultural employment negatively and non-agricultural employment positively in the period under review.

Wage, inflation, and interest rates reduced employment in both agricultural and non-agricultural sectors. Employment in agriculture depended on employment and output in non-agriculture and vice versa.

5.3 Policy recommendations

(1) The observed disparity in key macroeconomic outcomes (good growth performance coexisting with high and rising unemployment) indicates a lack of coordinated integrated macroeconomic management. It is recommended that policy makers and the managers of the economy should always define, specify and monitor Employment-Growth objectives to ensure employment intensive growth always.

(2) In designing solutions to the problem of unemployment in Nigeria, policy makers should give priority attention to sectors of the economy with relatively high labour absorptive capacities. The strategy should be how to optimise the job creating potentials of the sectors. Attention should also be focused on the sectors of the economy that are presently insignificant in job creation. The strategy here should be to prevent and /or minimise job losses; improve the quality of jobs; and, creatively stimulate job creation with appropriate policy intervention.

(3) Due to sectoral peculiarities, sector-specific strategies should be designed and implemented. Concerning the agricultural sector, here are some recommendations:

Agriculture holds great potentials for job creation in Nigeria. Consequently, government and policy makers should pay more and commensurate attention to the sector by providing enabling environment and making it more attractive as a business and affordable to the unemployed.

Attention should be focused on deploying value chain analysis along all product lines and subsequently employing appropriate policies (bans, tariffs and positive incentives) to create and retain, in Nigeria, all the potential jobs along each value chain. This should be preceded by job mapping along each value chain in view of the inter-sectoral dependence of job creation in Agriculture on the other sectors.

5.4 Suggestions for further studies

Opportunities abound for further research into this area arising from the following factors.

First, from the observed pattern of unemployment during the period under review, Nigeria had lower unemployment rate under military administration than it had under civilian administration, contrary to expectations in socio-political discourse, where civilian democracies are preferred.

This, therefore, presents an opportunity for further research to unravel the distinctive causes of this aberration.

Secondly, the reclassification of economic activities and the GDP rebasing exercise of 2014 have brought on board (or exposed) sectors and sub-sectors of importance that will be significant in generating employment. For example, economic activities in the ICT sector has expanded rapidly, especially post 2001, when telecommunication was privatised and the sector liberalised. The full impact of employment generation, in the sector can only be appreciated if economic activity and growth in that space is effectively isolated, recorded, and analysed. While post GDP rebasing record will capture this, pre-rebasing record did not capture it effectively.

Thirdly, the National Bureau of Statistics (NBS) has decomposed GDP figures backwards on the basis of the new classification, but sectoral employment figures have not been provided along those lines as of the time of this study. If and when it is done it will provide backward data on the basis of the new classification during the rebasing exercise of 2014. Consequently, sectorial employment intensity of sectorial gross value added could be investigated on the basis of the new classification which will apply the decomposed time series data.

Furthermore, the National Bureau of Statistics (NBS) would need to improve on the type, completeness, continuity, consistency, and accuracy of economic data base to facilitate research and policy making. When data becomes available in the required form and frequency (for example, quarterly) it gives rise to opportunities to investigate into greater detail the employment intensity of growth and other useful economic variables.

Finally, there is scope for a more detailed drill-down into sub-sub-sectorial details of the new classification which has taken sub-sectors from 33 as at 2013 to 46 in 2014 by the time economic data becomes available along the new classification.