

Unemployment Convergence among the 36 States in Nigeria

Being a Revised Paper Presented by:

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At the

**Finance and Economics Conference 2013
in Frankfurt am Main, Germany
Thursday July 4th to Saturday July 6th**

Abstract:

Given the spate of bombings, kidnapping, armed robbery and terrorism in Nigeria there has been renewed efforts to tackle the high unemployment rate in the country. This is more so because vast differences in unemployment rates among the states are indicative of regional economic inequality and poverty. This paper investigates the dynamics of unemployment rates among the states in Nigeria and the prospects for convergence with the national rate. We use more theoretically defensible unit root tests with structural breaks and the autoregressive fractional integrated moving average (ARFIMA) approach. Our results show that behavior of unemployment rates of thirty(30) states are consistent with the structuralists/NAIRU thesis given that they are stationary with breaks. We also investigate the prospects for convergence in relative unemployment rate among the states. We find some evidence of a process of conditional convergence among ten states with the national unemployment rate. However we find some evidence of non-convergence among 27 states. For these states the fractional integration parameter d exceeded unity. The fact that ten states display stochastic convergence suggests that at least part of Nigeria is converging. This means that poorer states are on the average catching-up to the national unemployment rate. The non convergence of relative unemployment differentials of most of the states is indicative of the long lasting problem of unemployment which may not go away. Policies aimed at reducing relative unemployment differences are likely to make much impact when they are substantial. These include substantial investment in infrastructural rehabilitation in electricity, road and rail network, development of entrepreneurial skills among the youth and government provision of start-up grant or loans.

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Introduction

Terrorism, kidnapping, armed robbery and the spate of bombings in Nigeria of recent has brought to greater attention the challenge of unemployment in the country. Some analysts (Mohammed 2012) have argued that the high rates of unemployment is the grease that promotes and propagate not only the incidence of poverty but also crime and insecurity. According to Mohammed the “the hallmark of poverty and crimes in Nigeria” is the level of “unemployment among its active-age citizens”. If Nigeria can tackle the high rate of unemployment in the country by creation of productive employment, the battle against poverty and crime would have been won. The view by Mohammed has rekindled a troubling reality of an alarming employment crisis in Nigeria despite improved economic growth(i.e non-inclusive growth). According to the National Bureau of Statistics (NBS 2010) the high incidence of unemployment amid economic growth is indicative of major socio-economic dislocations in the country.

Unemployment rate has witnessed persistent rise over the years in Nigeria. Average unemployment rate in the past four decades (1970-2011) is about 9.67 percent, 5.52 percent during the period 1970-1989, and two-digit value at 13.46 percent during the period 1990-2011(CBN 2002, 2007; NBS 2010, 2009,2012; World Bank 2005). The national unemployment rate masks significant disparities or differences among the states’ unemployment rate. For instance, while the national unemployment rate was 19.7% in 2009, the unemployment rate for Bayelsa was 38.4%, Katsina 37.3%, Bauchi 37.1%, Akwa Ibom 34.1%, and Gombe 32.1%. The sectoral decomposition of unemployment rate with respect to age-group is even more revealing. The unemployment is highest for the youth 15-24 (age –group) at 41.6%, followed by the 25 – 44 age group at 17%, 60 - 64 age group at 16.7% and 45 - 59 age group at 11.5% . With respect to educational group the records show that the unemployment rate is 20.1% for those who never attended school, 22.3% for below primary school, 14.8% for primary school, 23.8% for secondary school and 21.3% for post secondary education. According to International labour Organization Report (2010) graduate

unemployment which was 26.6% in 2003 rose to about 40.3% in 2009. This is unacceptable.

Several *ad hoc* policies and programmes aimed at reducing the rate of unemployment in Nigeria have been implemented over the past years with minimal effect. These include the National Directorate of Employment (NDE), an agency of government established in March 1986 to create jobs for the teeming army of the unemployed by designing and implementing appropriate programmes to combat mass unemployment; the Small and Medium Scale Enterprise Development Agency of Nigeria (SMEDAN); the National Poverty Eradication Programme (NAPEP), the National Economic Emancipation and Development Strategy (NNEDS) of 2003, among others. In spite of these programmes, unemployment rates in the country and among the states have continued to rise, thereby casting serious doubt about the effectiveness of the agencies and their programmes.

Persistency in subregional unemployment rate may reflect stable equilibrium differentials in unemployment rates or may be attributed to the fact that shocks to subregional unemployment rates have long-lasting effect (Martin 1997; Bayer and Juessen 2006). Discriminating among the two cases is important because policy interventions are more likely to be effective in the case of long-lasting effect than in stable equilibrium differentials.

The objective of this study is to investigate the hysteresis or persistence effect in the unemployment rates of the 36 States and Federal Capital Territory (FCT) in Nigeria and determine the prospects for stochastic convergence of unemployment at lower levels. To the best of my knowledge this is the first systematic attempt to do so in Nigeria. This is necessary for five reasons. First, the national unemployment rate is uninformative, and perhaps misleading as it masks vast unemployment differentials among the states and regions. Second, wide and growing disparities in unemployment rates among the states threaten socio-economic cohesion, compromise national unity and economic integration. Understanding the dynamics and persistence of subnational (states) unemployment differences helps to assess their consistency with established labour market models and the effectiveness of national and subnational economic policies. Third, high unemployment rates have not only economic, but also political and social consequences including labour market reforms (Layard et al., 2005). Fourth,

regardless of the integration order of the unemployment series, it is important to study convergence to determine whether the states have something in common which attract them in the long-run. Finally, there has been limited studies on convergence of unemployment rates among the 36 states in Nigeria. The few that exist such as Obadan and Odusola(2001), Muhammed et al. (2011), Bankole (2002) and Abiodun (2010), Samuel et al (2011) Aiyedogbon and Ohwofasa(2012) focused primarily on unemployment and productivity in Nigeria and graduate unemployment at the national level. Aiyedogbon and Ohwofasa(2012) for example investigate the relationship between poverty and youth unemployment at the national level in Nigeria. They find a positive and statistically significant effect of unemployment on the incidence of poverty. Our study is the first of its kind to investigate the dynamics of sub-national unemployment rates and prospects for convergence using disaggregated data. Furthermore the results of this study may serve as a benchmark of what to expect about long-run behavior of unemployment rates in the ECOWAS subregion. The study covers the period 1990 - 2011. The choice of the period is dictated by the rising rate of unemployment during the period, the availability of unemployment data at the State level, the need to cover both the military dictatorial regime period (1990-1999) and the civilian democratic governance (1999-2011). Quarterly data are used.

The rest of this study is organized in five sections. The first had been the introduction and background of study. Section II provides the theoretical framework and literature review. In section III an overview of Nigerian unemployment rate at national and State levels is articulated. Section IV presents the analytical methodology. In section V presents the empirical results and analysis. We conclude the paper in section VI with a summary of main results and the policy implications.

II Theoretical Framework and Literature Review

One of the basic assumptions underlying macroeconomic theories is the existence of equilibrium in economic variables. Shocks in the economy are assumed to have temporary effects and the variables are expected to converge to their long-run equilibrium level. This has given rise to debates in labour market theories concerning the behavior of unemployment rate. There are two dominant schools to the debate. The structuralists perspective *a la* Phelps(1967) and

Friedman(1968) maintains that changes in economic fundamentals (shocks) may bring about movement or shifts in unemployment around its natural rate and have no permanent effect whatsoever on the natural rate. By implication unemployment rate is stationary around the natural rate. According to structuralists although economic fundamentals like interest rate, government capital expenditure and productivity may alter the equilibrium rate, there is an inherent tendency to return to equilibrium after some time. They insist that once structural breaks are accounted for while testing for stationarity of unemployment rate, it will yield a stationary process. The structuralists school perspective is a relaxed version of the non-accelerating inflation rate of unemployment (NAIRU) thesis which states that there is a long run unemployment rate and hence that shocks to unemployment have only transitory effects. This is the view followed by Phelps(1994) and Phelps and Zoega(1998). According to Phelps(1994) unemployment rate is a stationary process around a small number of structural breaks (Lee, Strazicich and Tislau 2011) . Shocks to unemployment are temporary with autonomous movements in the natural rate itself, due to changes in the structure of the economy.

In contrast to the structuralists school of thought the hysteresis school argues that temporary shocks will have permanent effects on the equilibrium unemployment rate, thereby leading to nonstationarity of the unemployment rate (Blanchard and Summer 1986). The school insists that cyclical fluctuations generated by business cycles have permanent effect on unemployment. Unemployment is a random walk which never returns to equilibrium after shock. While hysteresis insists on permanent effect, the persistence theory takes a more relaxed view maintaining that unemployment does return to natural rate but needs long periods to recover after a shock.

The policy implications for either school of thought are straightforward. For the structuralists it suggests that government should focus on preventing short-run departures from equilibrium. For the hysteresis school, it suggests the speed at which unemployment can be reduced (Mikhail, 2002). It indicates the need for macroeconomic stabilization policies , structural reforms, and design of social safety nets to counter the negative shocks(Leon-Ledesma and McAdam, 2004). It is well known that for countries with evidence of multiple equilibria, reforms carried out to reduce unemployment benefits could constitute large and long-lasting positive shocks if done during an employment recovery phase. However,

reforms carried during rising unemployment may not have the desired effect of changing equilibrium unemployment as the positive labour market reforms could be choked – off by the negative (demand or supply) shock affecting the economy.

When labour markets adjust towards equilibrium in the long run, there will be convergence of subregional unemployment rates. Unemployed workers take jobs in other areas because capital flows into low-wage regions to take advantage of lower labour cost (Blanchard and Katz 1992, Bayer and Juessen 2006). However, if the speed of adjustment is slow, disparities in unemployment may arise during adjustment as a result of negative demand shocks affecting some regions more than others (Armstrong and Taylor 2000).

Three main theories have been advanced to explain the sources and causes of hysteresis - duration theory, insider-outsider theory and the capital stock theory. Duration theory is concerned with the effect of unemployment duration on labour market outcomes in terms of demand and supply of the unemployed. According to duration theory, the longer the unemployment period, the less likely the unemployed are likely to be offered jobs, as firms use their long period of unemployment as a screening device to hedge them out of unemployment. The insider-outsider theory maintains that insiders have bargaining powers which enable them to negotiate and determine wages, retain their jobs and prevent outsiders from being employed. However, Blanchard and Summers(1986) and Gregory (1986) have shown that large negative shocks may lead to job loss among insiders, thereby causing increase in unemployment rate. Indeed Gregory (1986) was the first to argue that insider considerations could lead to sustained unemployment in Austria. The capital stock theory suggests that adverse shocks lead to contraction in firms' capital and may eventually lead to business closure and job losses. By implication, adverse capital stock shocks leads to increase and persistent rise in unemployment rate.

The implication of the above analysis is that multiple equilibria may arise in unemployment level due to any of the three sources indicated above. For example in a study by Leon-Ledesma and McAdam(2004) they observe the presence of high and low unemployment equilibria among Central and Eastern European Countries (CEECs). The speed of adjustment is faster for CEECs than for the EU,

although CEECs tend to move more frequently between equilibria, indicating that they do not remain locked into a new level after a shock.

A number of models have been developed to account for multiple employment(unemployment) equilibria such as Aghion and Blanchard(1994) expectation model in which the expectations of economic agents could lead to a high unemployment equilibrium in developing countries and Boeri(2001) microeconomic lock-in model in which skill specificity of workers and search incentives could generate high persistence rise in unemployment rate. In spite of these models, it is the traditional inside-outsider model of unemployment hysteresis of Blanchard and Summers(1986) that have been used in many studies.

Formally and in line with Leon-Ledesma and McAdam (2004), assume that unemployment rate (y) follows a AR(K) process such that

$$Y_t = \psi_0 + \sum_{k=1}^m \psi_k Y_{t-k} + \varepsilon_t \quad (2.1)$$

where t is time period, k is lag operator and ε is stochastic random shocks. It is expected that unemployment will always converge to its natural or equilibrium level which is defined as

$$Y = \frac{\psi_0}{1 - \sum \psi_k} \quad (2.2)$$

with the assumption that $\sum \psi_k < 1$. If this hold then unemployment is said to be mean-reverting. Unemployment will follow random walk and hence non-stationary, and exhibiting path-dependence if $\sum \psi_k = 1$. This is what is referred to as pure hysteresis whereas partial hysteresis which occurs when $\sum \psi_k \approx 1$ (see Layard et al. 1991). Once unemployment follows random walk, then shocks ε are assumed to have permanent effects on unemployment.

Given the fact many developing countries are characterized by shocks which may lead to breaks in the trend or time paths of macroeconomic variables, conventional unit root tests may not reveal the true nature of the data generating process. Hence structuralists argue on the need to account for structural breaks in testing for unit roots in macroeconomic data.

Empirical studies on unemployment rate have concentrated on time series econometrics by checking the order of integration of the unemployment rates. Areti and Mariscal(1999), Lee and Strazicich and Tislau(2001) as well as Camarero and Tamarit(2004) adopted this methodology, each one with some peculiarities but all of them are based on OECD countries. Camarero and Tamarit (2004) test the hysteresis vs natural rate of unemployment for a panel of 19 OECD countries using sequential procedure based on two multivariate ADF panel unit root test in SURE framework. The results confirm the validity of the natural rate of unemployment hypothesis. Lee et al (2001) investigates the validity of the hysteresis hypothesis using annual unemployment rate of 17 OECD countries for the period 1955 – 1999. They adopted panel Lagrange Multiplier (LM) unit root test which allows for heterogeneity in structural change (breaks) and find strong rejection of the hysteresis hypothesis. Similar acceptance of NAIRU was obtained in Camarero and Tamarit(2004) for a panel of 17 OECD countries. Blanchard and Summers (1987), Brunello(1990), Mitchell(1993), Roed(1996), and Leon-Lesdesma (2002) employ conventional univariate unit root tests to investigate the behavior of unemployment rates in European Union (EU) countries. They find that that unemployment exhibits hysteresis. However, empirical evidence on US unemployment rates are inconclusive. Mitchell(1993), Breitung(1994), and Hatanaka(1996) find non-convergence in US unemployment rate while Nelson and Plosser (1982), Perron(1988), Xiao and Phillips (1997) report evidence in favour of convergence.

Neudorfer et al. (1990) examine hysteresis or persistence effects in Austrian unemployment based on unit root tests and model of wage-price formation. The results show high persistence in unemployment caused by rising share of long-term unemployed which leads to increase in overall unemployment rate.

Cheng et al. (2011) investigate the stochastic nature of unemployment rate from a panel of 51 US state level data allowing for cross-section dependence for the period 1976 Q1 to 2010 Q2. They find significant evidence of hysteresis when more recent data are included and convergence when data from the Great Recession are included. However, they question the practical usefulness of the natural rate hypothesis given the fact that they obtain half-life point estimates ranging from 6 to 14 years “after correcting for bias”. According to them the half–

life “appears quite long compared with typical duration of economic recession”. Similarly Rowthorn and Glyn(2003) examine the convergence and stability in US regional employment. They find that although regional labour markets in the US are said to be highly flexible so that employment shocks have only transitory effects on joblessness since induced migration quickly offset much of the initial impact their empirical results show otherwise. They find that responsiveness of employment rates to state specific shocks are rather weak implying that flexible regional adjustment is not a factor accounting for “the success of monetary union in USA”.

The importance of investigating subregional unemployment rates has been documented by Marston (1985) based on the compensation theory which predicts that in equilibrium all individuals have the same utility level, and so areas which are more attractive could have larger unemployment rate. His empirical study reveals that disturbances to equilibrium relationship in unemployment rates among US metropolitan regions are likely to disappear because of mobility with a particular year. Blanchard and Katz(1992) analyze the dynamics of the American regional unemployment rate. Their findings indicate that when jobless individuals move to other areas in search of work, there is adjustment of the labour market towards long-run equilibrium – ie convergence in regional unemployment rates. Specifically they find that both unemployment and labour force participation shock returned to their original levels within about seven years of a state specific employment shock and about four years after the change in unemployment had reached its maximum. Thus, US absorb regional employment shocks in a highly flexible manner with regional migration being the main channel of preventing long-lasting effects of joblessness of state specific shocks in the US.

Wu (2003) studies the Chinese unemployment persistence through panel data regression approach. The results show that (i) regional relative unemployment rate show greater persistence when compared to nation-wide unemployment rate, (ii) total unemployment is more persistent than youth unemployment, (iii) region with the highest unemployment rate is the one with the lowest persistence of regional unemployment, (iv) Chinese job seekers are usually driven to the private sector, which has helped reduce the unemployment persistence.

Oliveira and Careiro(2001) investigate the existence of equilibrium relationship between states and national unemployment rates. Their findings suggest that states and aggregate unemployment rate have similar dynamism, but with permanent differences in the long – run. Assuming that states have different attractiveness level, the result is consistent with Marston (1985) prediction that in equilibrium all individuals have the same utility level, and so areas more attractive could have larger unemployment rate.

Boeri and Terell(2002), Ferragina and Pastore(2005) inquire if the differences in unemployment rate in transition economies could be explained by the optimal speed of transition theory. Frek et al (2004) was more concerned about the Czech Republic. In an influential study of the evolution of labour market in the Czech Republic, Flek et al (2004) submit that over the period of ten years, a transition from over-employment to underemployment may have taken place.

Katrencik et al. (2008) criticized previous studies in transition economies arguing that they are not consistent with recent labour market developments because they used fairly aggregate data rather than policy-relevant data. He also submits that past studies failed to incorporate structural breaks in the labour market condition and this failure might have compromised the results obtained.

Carmeci and Chies(2006) examine the role of structural breaks in Italian unemployment hysteresis. The findings show that hysteresis is not sensitive to with or without structural breaks and that the finding of hysteresis in national unemployment rate in Italy is a result of aggregation of regional trend-stationary unemployment rate characterized by heterogenous breaks.

In Brazil Gomes and da Silva(2006) examine the hysteresis hypothesis effect of unemployment rates in six metropolitan areas using unit root test with structural breaks. The results reveal that hysteresis is absent in all the regions except Rio de Janeiro. Further analysis indicate the existence of stochastic convergence in all the regions except Porto Alegre. Oliveira and Carneiro(1999) examine the short-run and long –run relationship between national unemployment rate and subregional unemployment rate and obtained mixed results. Corseuil, Gonzaga and Issler (1999) investigate the short-run and long-run unemployment movements across the six metropolitan regions in Brazil. The results were not conclusive. But

the study by de Figuerado(2010) were more definitive. De Figuerado examines the dynamics of regional unemployment rates in Brazil using a fractional integration approach. The results show that both persistence and non-stationary but mean-reversion exist in Brazilian regional unemployment rates. His test of stochastic convergence show that regional unemployment rates are convergent. There is no similar study for Nigeria at subregional or state level. This is the point of departure of this study.

Fallahi and Rodriguez(2010) investigates the degree of persistence of regional unemployment rate in Canada using quarterly data for the period 1976:1-2005:4 based on endogenous structural breaks methodology. Their findings indicate that the degree of persistence decrease with structural breaks and that the rigidity of Canadian labour market, unemployment insurance benefits, inter-provincial redistribution, attitude towards migration and industry structure are major causes of persistence.

III Overview of Unemployment rate in Nigeria and the States

The Nigerian economy has experienced several and external shocks that have resulted in severe distortions and caused structural changes. The resultant effect had been fluctuations in major macroeconomic aggregates such as output, inflation, balance of payments, consumption, investment, and unemployment rate. Of major concern to policy makers is the upward trend in the unemployment rate while other macroeconomic variables like real GDP growth and balance of payments have shown significant improvement. Trends in unemployment rate had assumed worrisome upward trend since 1997. With average national unemployment rate of about 9.56 percent between 1990:1 and 1994:4 the unemployment rate became double digits thereafter rising to 10.72 percent in the next period (1995:1-1999:4), and to 18.03 percent in the period 2006:1- 2011:4 as shown in Table 3.1. The movement in unemployment rate is better appreciated by the quarterly trend as indicated in Figure 3.1. The figure reveals quite clearly the rising and worrisome trend in the unemployment rate in Nigeria and the need for realistic government policy intervention to stem the tide. National unemployment rate attained its highest value in 2011:4 at 23.9 percent.

Table 3.1: Average National Unemployment Rate

Year	Mean	Maximum	Average population unemployed
1990:1 - 2011:4	13.24	23.90	12.37 million
1990:1 - 1994:4	9.56	10.80	10.37 million
1995:1 - 1999:4	10.72	12.50	11.88 million
2000:1 - 2005:4	13.25	14.80	17.69 million
2006:6 - 2011:4	18.03	23.90	40.39 million

Source: computed from records of National Bureau of Statistics

Figure 3.1: Dynamics of national unemployment rate 1990:1-2011:4

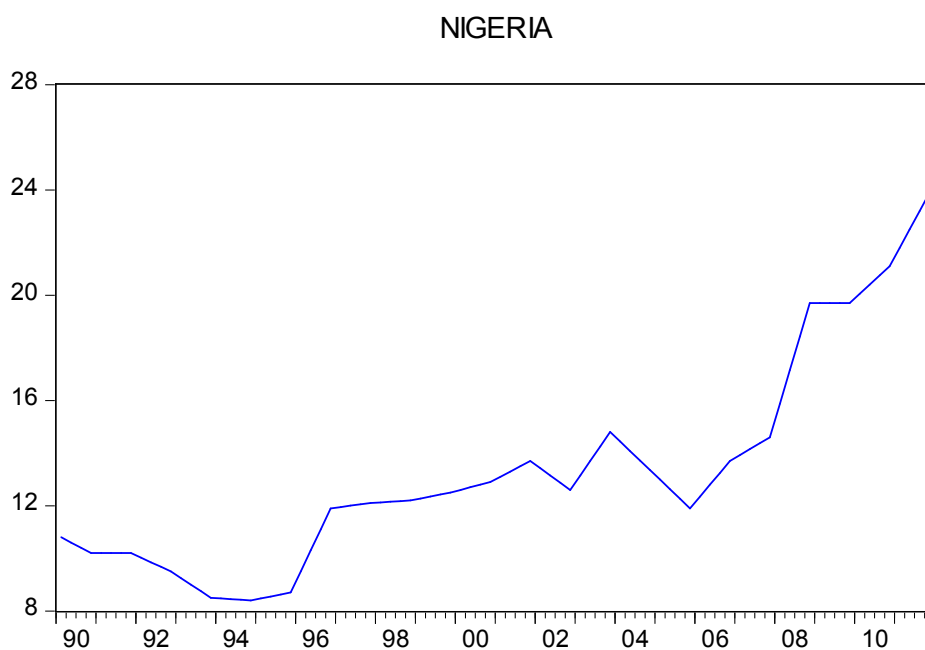


Fig 3.2: Dynamics of Disparities in Unemployment Rates among the States and FCT

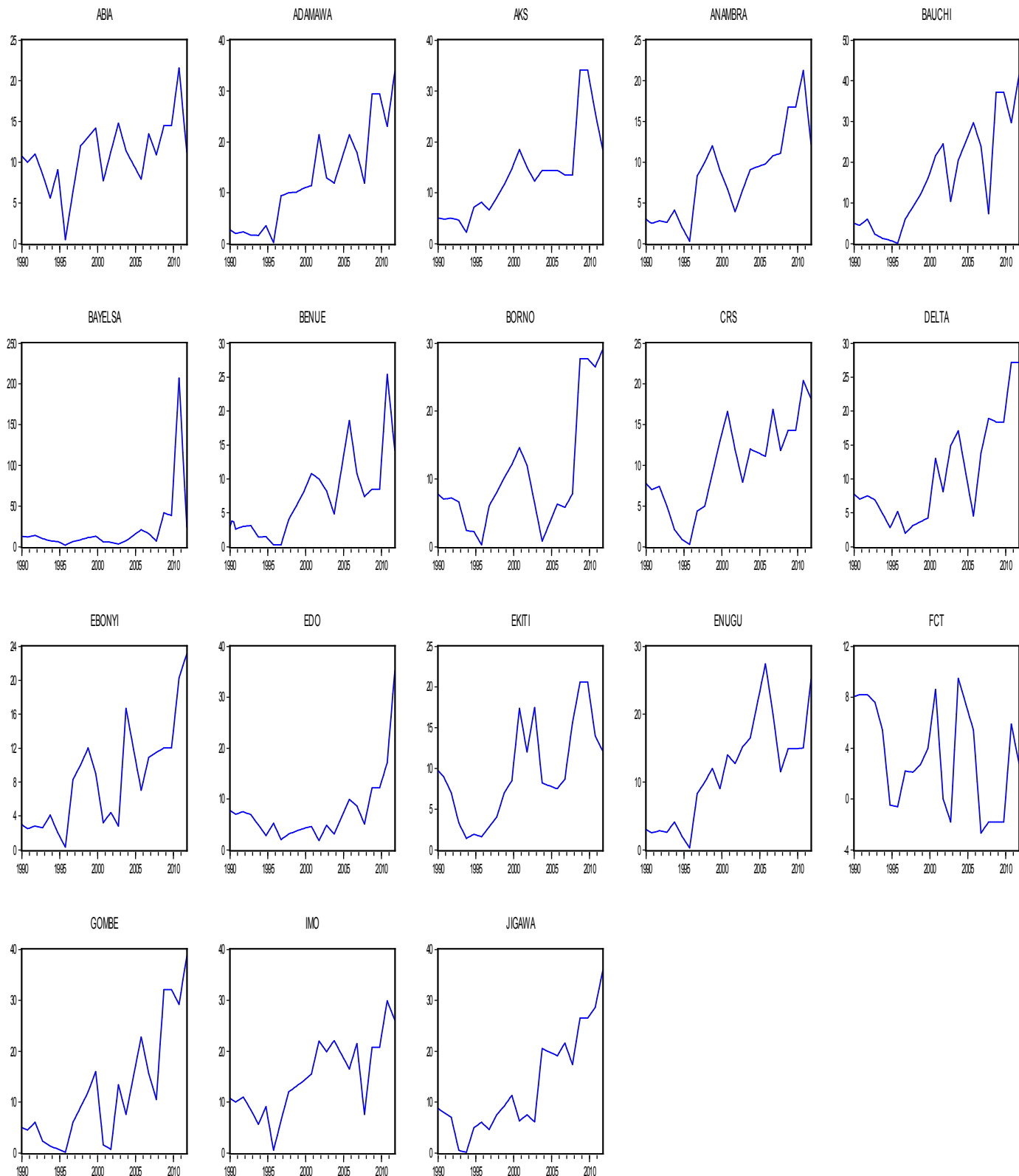


Fig 3.2: Dynamics of Disparities in Unemployment Rates among the States and FCT continued

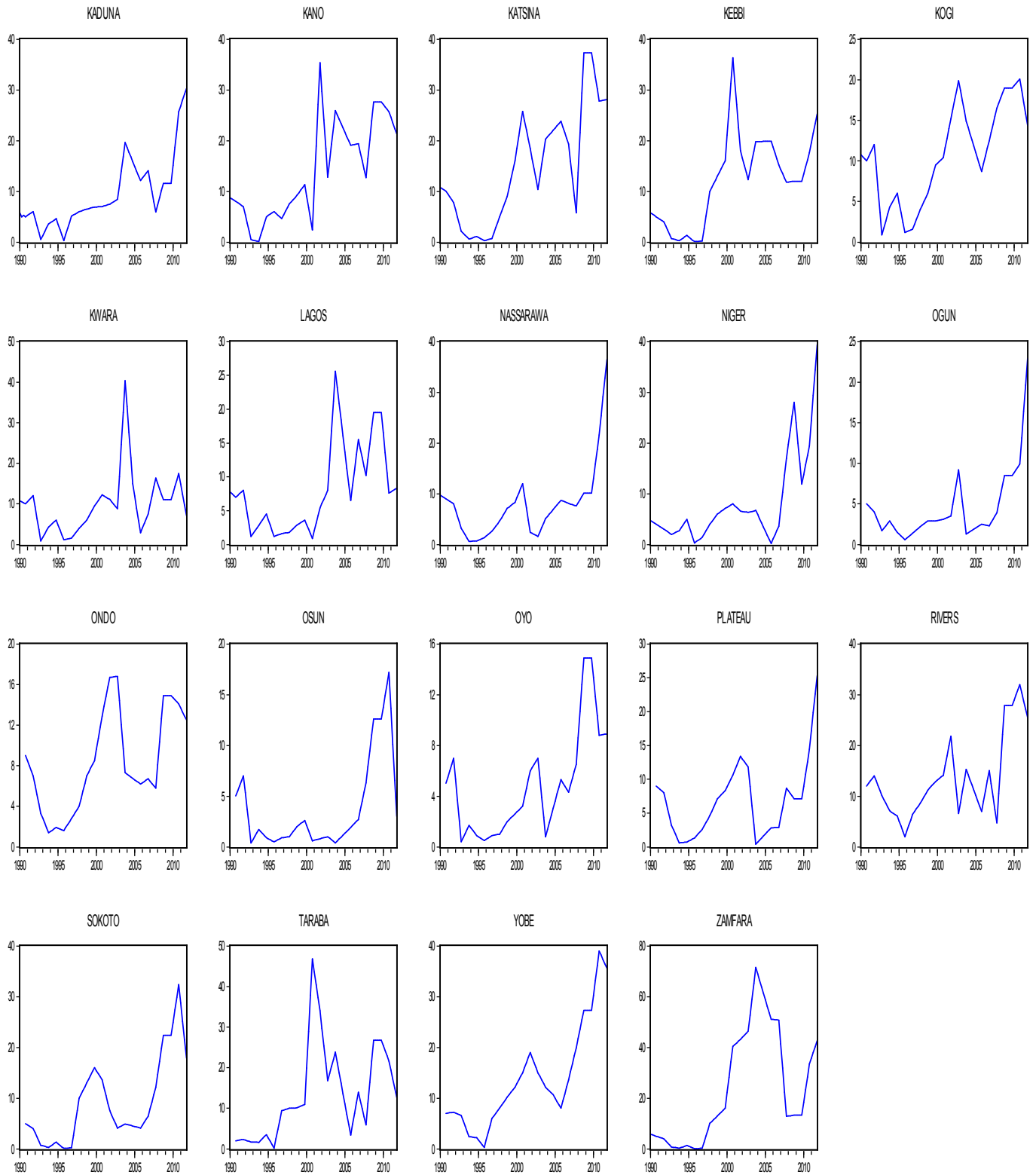


Figure 3.2 indicates the dynamics of subnational (states) disparities in unemployment rate. From the Figure we find that unemployment rate among the states showed wide fluctuations with Bayelsa displaying the widest dispersion with estimated standard deviation of 36.01, followed by Zamfara at 21.83, Bauchi at 11.92, Taraba at 11.12, Katsina at 10.95, Gombe at 10.50 in that order. Others include Yobe at 98.3, Jigawa at 9.19, Kano at 9.17 and Adamawa at 9.05.

Most of the states started with low rate of unemployment less than 10 percent in first quarter of 1990. This rose with time to double digits becoming worse in the 2000s. However, six states started with higher unemployment rate above 10 percent in the first quarter of 1990 but grew to double digits and become worse in the 2000s. These include Abia recording higher unemployment rate of about 20 percent in 2010, Ekiti with over 20 percent in 2010, Imo with about 30 percent in 2010, Nassarawa with over 38 percent in 2011, Kwara with about 38 percent in 2008 and Rivers with about 33 percent in 2010. A map showing the states in Nigerian is provided at the appendix as Figure 3.3.

All the states experienced two or more structural breaks in their unemployment trends. For instance Abia state experienced three structural breaks, first in 1995, second in 2001 and third in 2006. Adamawa also experienced three structural breaks (1995, 2005, 2008) but Akwa Ibom State (AKS) experienced two structural breaks (1995, 2003). The rest are similarly interpreted. A common structural break date for all the states is 1995. This may be indicative of effect of the confusion in government policy - deregulation before 1994, regulation of the economy in 1994, and back to deregulation of the economy again in 1995.

An interesting unemployment dynamics is that indicated by Bayelsa and Zamfara States. Bayelsa consistently maintained low unemployment rate of less than 5 percent until 2007 when the rate started rising hitting an all time high value at 33 percent in 2010. Zamfara on its part displays a normal distribution in unemployment rate with concentration of high unemployment rate between 1997 and 2007 recording the highest rate at 71.5 percent around 2003 and 2004.

Another interesting characteristic of the evolution of unemployment rate among the states is the poor performance of the northern states which show higher unemployment rates particularly in the period 2000-2011, an era of

democratization and civilian governance. It suggests inadequate investment by the northern governors in infrastructure and in agriculture and lower proportion of capital expenditure in total expenditure. Furthermore the higher level of insecurity in the North may be responsible for increase in unemployment rate, although it may also be argued that unemployment may also cause insecurity.

An important characteristics of state labour force is that the Southern States have more educated labour force than the Northern states, and unemployment is more severe in the North than in the South. The lack of education of appropriate skills in the Northern States complicate the unemployment situation in the North. The mismatch between skills and job availability has led to the appearance of long-term unemployment for most of the Northern States.

The adoption of structural adjustment programme since 1986, the retrenchment of civil servants in the public sector in the late 1980s and early 1990s, the distress in the financial system in the 1990s, the change from dictatorial military regimes in the 1999 to civilian democratic governance, the consolidation and recapitalization of banks in 2004/2005 as well as the implementation of the national economic emancipation and development strategy (NEEDS) in the 2003/2004 means that the labour market has not been able to absorb these shocks as expected by the creation of new jobs in the private sector and the improvement of matching induced by more market friendly policies as indicated in NEEDS. This had led to high unemployment observed in Nigeria and among the states with persistence and long duration of unemployment spells.

It would be wrong to associate the persistence of unemployment with the flexibility of labour market because the conventional factors used to explain maladjustment such as union strength, minimum wages and employment protection legislation are either weak or ineffectively implemented in Nigeria. The absence of unemployment benefits acting as a wage floor may have discouraged job reallocation. In addition, multiple equilibria which arise due to microeconomic lock-in effects, owing to the excessive skill specificity would generate the appearance of long spells of unemployment and regime shifts (Aghion and Blanchard 1994).

Table 3.2 provides further characteristics of the structure of unemployment rate. According to National Bureau of Statistics (2011) unemployment in Nigeria is largely rural based, with high concentration of unemployment among the youth and secondary school leavers. It indicates that about 67 million youths are unemployed out of a population of 167 million in 2011. Worried by this trend the

Table 3.2: Structure of Nigeria's Unemployment(2011)

Structure		Unemployment Rate (%)			
		1999	2005	2009	2011
Educational level					
	No school	23.20	11.52	20.1	22.4
	Primary	13.80	7.83	14.8	21.5
	Secondary	57.60	11.70	23.8	33.4
	Tertiary	5.40	9.52	21.3	20.2
Gender					
	Male	53.60	10.37	23.5	
	Female	46.40	14.65	24.3	
Location					
	Rural	10.11	11.50	25.6	
	Urban	12.23	11.00	17.1	
Age composition					
	15-24	59.40	26.01	41.6	37.7
	25-44	27.70	10.83	17.0	22.4
	45-59	7.60	7.10	11.5	18.0

Sources (i): National Bureau of Statistics: 2011 Socio-Economic Report.

(ii): National Planning Commission: Economic Performance Review 2006(April/July)

Federal Government recently embarked on The Youth Enterprise with Innovation Scheme to generate jobs by encouraging entrepreneurship among the youths. It is envisaged that over a 3-year period in which the second cycle will be completed in September 2013, between 80,000 to 320,000 new jobs will be created at a cost of N10 billion Naira. Government has also carried out women and youths employment project out of the subsidy reinvestment and empowerment programme(SURE-P) targeting employment of about 300,000 youths, women and the disabled each year.

Various explanations for the rising trend in unemployment have been put forward. These include the rural-urban migration in search of jobs in the urban centers, retrenchment in the public sector in 1990s coupled with distress in the financial sector, dilapidated infrastructure and epileptic electric power supply leading to many industries to close shops, and low and sluggish economic growth. Critical infrastructure in Nigeria had continue to decay across the nation. The non-diversification of the economy away from the oil, means that the oil-sector which is capital intensive enclave will continue to have little employment generating potentials. As a result Nigeria is in danger of not achieving some of the millennium development goals (MDGs).

Another dimension of the unemployment problem is the existence of high rate of economic growth amidst high level of unemployment and incidence of poverty. For example in 2011 the growth rate of real GDP was about 7.4 percent but the unemployment rate was as high as 23.9 percent (AEO 2012). Thus, the economy suffers from non-inclusive growth suggesting, the failure of the trickle-down effect thesis in development policy and the need to diversify the economy from oil to manufacturing and agriculture.

IV Analytical Methodology

4.1 Conventional Augmented Dickey-Fuller Test

We first tested for degree of persistence in national and state unemployment rates to determine the consistency of the behavior of Nigeria's unemployment rate with the structuralists or hysteresis school of thought. We adopted both the traditional augmented Dickey Fuller test and endogenous unit root test with multiple structural breaks indicated in equations 4.1 and 4.2-4.6 respectively.

Conventional ADF model takes the form:

$$\Delta U_t = \psi_0 + \psi_1 T + \psi_2 U_{t-1} + \sum b_i \Delta U_{t-i} + v_t \quad (4.1)$$

where U_t is the unemployment rate, T is the time trend, Δ is the difference operator, $\psi_0, \psi_1, \psi_2, b_i$ are parameters to be estimated. The existence of unit root is indicative of hysteresis and rejection of the unit hypothesis is confirmation of the structuralists (or NAIRU) hypothesis.

4.2 Unit Root Test with Breaks

The Lee and Strazicich Langrange multiplier model of unit root test with two endogenous structural breaks takes the form:

$$\Delta U_t = \delta' \Delta Z_t + \phi \bar{A}_{t-1} + \sum \psi_i \Delta \bar{A}_{t-i} + u_t \quad (4.2)$$

where \bar{A}_t is a detrended series such that $\bar{A}_t = Y_t - \hat{S}_x - Z\delta^*$, $t=2,3,\dots,T$; δ^* are the estimated coefficients in the regression of ΔY_t on ΔZ_t ; \hat{S}_x is given by $Y_t - Z_t \delta_t$; and Y_1 and Z_1 represent the first observations of Y_t and Z_t respectively. Z_t is a vector of exogenous variables defined by the data generating process. Corresponding to two-break equivalent of Perron of Perron's (1989) model C, with two changes in level and trend, Z_t is described $[1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t}]'$. where $D_{jt}=1$ for $t \geq TB_j + 1$, $j=1,2$ and zero otherwise; $DT_{jt}=t - TB_j$ for $t \geq TB_j + 1$, $j=1,2$ and zero otherwise. Note that the test regression (2) involves ΔZ_t instead of Z_t so that ΔZ_t becomes $[1, B_{1t}, B_{2t}, D_{1t}, D_{2t}]'$, where $B_{jt} = \Delta D_{jt}$ and $D_{jt} = \Delta DT_{jt}$, $j=1,2$. The unit root null hypothesis is described in equation (2) by $\phi=0$. And the test statistics are defined as follows:

$$p = T \cdot \phi' \quad (4.3)$$

τ = t-statistic for testing the unit root null hypothesis that $\phi=0$.
(4.4)

To endogenously determined the location of the two multiple breaks ($\lambda_j = Tbj/T$, $j=1,2$) the minimum LM unit root test uses a grid as follows:

$$LM_p = \inf_{\lambda_p}(\lambda), \quad (4.5)$$

$$LM\tau = \inf_{\lambda} \tau(\lambda). \quad (4.6)$$

The location of the structural break (TB) is determined by selecting all possible break points for the minimum t-statistic. The search is carried out over the trimming region (0.1T, 0.9T), where T is sample size. We set the maximum lag length equal to eight ($K_{\max}=8$) and use the 10 per cent asymptotic critical value of 1.645 to determine the significance of the t-statistic on the last lag. After determining the optimal lag length at each combination of breakpoints, we determine the breaks where the endogenous two-break LM t-test statistic is at a minimum. Critical values for the one break case are tabulated in LS(2004), while critical values for the two break case are tabulated in LS (2003). This technique has been shown to perform well as compared to other data-dependent procedures that select the number of lagged augmented terms as seen in Phillips-Perron (1988), Kwaitkowski et al. (1992), Ng and Perron(1995). It is also an improvement over Zivot and Andrews (1992) single break and Perron (1997), Lumsdaine and Papell (1997) double breaks methods.

4.3 Fractional Integration and Convergence Tests

After examining the unit root properties of unemployment rate we then tested for convergence of state unemployment rate to the national average, given Federal Government declared objective to fight unemployment in Nigeria. The methodology adopted is stochastic convergence proposition of Carlion Mills (1993) who study income convergence across U.S regions, and Bayer and Juessen (2006) who investigated convergence in West German Regional unemployment rates. We decided to adopt the theoretically defensible fractional integration analysis which is more suited to analysis of convergence and dispenses with the rigid knife-edge $I(0)/I(1)$ framework.

The fractional integration model adopted in is the parametric fractionally integrated moving average (ARFIMA) model which is a more flexible testing approach where the fractional integration parameter d can take any value, not necessary 0 or 1 as in the traditional augmented Dickey-Fuller (1979), or Phillip-Peron (1988) tests. It was introduced by Granger (1980), Granger and Joyeux(1980), Hosking (1981) and belong to long memory process. It takes the form:

$$(1-L)^d y_t = u_t \quad (4.7)$$

$$(1-L)^d = 1 - dL + \frac{d(d-1)}{2!} L^2 - \frac{d(d-1)(d-2)}{3!} L^3 + \dots \quad (4.8)$$

Invertibility is obtained whenever $-1/2 < d < 1/2$. The process is stationary for values of d in the interval $(-1/2, 1/2)$ (Notini and Lima, 2006). For values of d in the interval $(1/2, 1)$ the process is non-stationary, but mean reverting. In summary, for values of d less than unity unemployment shocks die out, even when the y_t process is non-stationary. We use the maximum Likelihood Estimate due to Robinson (1994) and available in OX ARFIMA package. The Lagrange Multiplier (LM) test due to Robinson (1994) is of the form:

$$H_0: d = d_0 \quad (4.9)$$

in a model given by

$$y_t = b_1 X_{1t} + b_2 X_{2t} + \dots + b_k X_{kt} + w_t \quad (4.10)$$

and (4.7), for any real d_0 , where y_t is the time series we observe; b_1, b_2, \dots, b_k , are unknown parameters to be estimated, w_t is a $(k \times 1)$ vector of deterministic regressors that may include, for example an intercept, e.g $w_t=1$, or an intercept and a linear trend, e.g $w_t=(1,t)$.

The use of ARFIMA approach in this study is an improvement over traditional time series unit root tests such as augmented Dickey-Fuller (ADF), Phillip-Perron(PP), Kwiatkowski-Phillip-Schmidt-Shin (KPSS) and Ng Perron because it accepts a continuum of integration orders not necessarily zero or unity (Dufrenot et al., 2003; Beyaert, 2004; Cunado et al., 2004). This approach enables us to discriminate between fractional long-run convergence and fractional catching-up

and hence to contribute to solving the puzzling negative or inconclusive results about convergence obtained in time series context. Fractional integration is a long memory approach in which deviations from the long-run mean decays more slowly (hyperbolic decay) than exponential decay.

The ARFIMA model is estimated with constant α and trend (trend parameter β) thereby providing a rich variety of nonlinear dynamics.

Case 1. Conditional Convergence ($\alpha \neq 0, \beta = 0$).

Case 1.1: Strict conditional convergence $-0.5 < d \leq 0$

Case 1.2: Long memory conditional convergence $0 < d < 0.5$

Case 1.3: Long memory mean-reverting convergence $0.5 < d < 1$.

Case 2.: Non-stationary process, absolute divergence $d \geq 1$

Case 3: Catching-up dynamics ($\alpha \neq 0, \beta < 0$).

Case 3.1: $-0.5 < d \leq 0$ rapid catching-up or short- memory catching-up

Case 3.2: $0 < d < 0.5$ long memory catching-up. This occurs when a state spends too much time on the transition path to the common long-run deterministic trend.

Case 3.3: $0.5 < d < 1$ long-memory mean-reverting catching-up.

The model was estimated by maximum likelihood method using James Davidson 2002-2012 Time Series Modelling (TSM) version 4.35 computer software. We test for convergence in unemployment rate among the 36 states and FCT for the period 1990-2011 using quarterly data.

V Empirical Results and Analysis

The empirical results are presented in Tables 4.1, 4.2 and 4.3. Results from traditional linear augmented Dickey-Fuller unit root tests are presented in Table

4.1. From the results we find that the national unemployment rate has double unit roots thereby confirming the validity of the hysteresis hypothesis. Out of the 37 states including Abuja/FCT only 7 states namely Benue and FCT (North Central), Cross River (South South), Ekiti and Osun (South West), Katsina and Sokoto (North West) exhibit stationary unemployment rate and hence are consistent with the structuralists school of thought while 31 states are non-stationary and hence are characterized by hysteresis in their unemployment rate.

Table 4.1: Results of ADF unit root test of Hysteresis

SN	Country/State	T-STATS	I(d)	Decision	SN	State	T-STATS	I(d)	Decision
1	NIGERIA***	-2.769	I(2)	Hysteresis	20	KADUNA*	-9.552	I(2)	Hysteresis
2	ABIA**	-3.18	I(2)	Hysteresis	21	KANO***	-2.84	I(1)	Hysteresis
3	ADAMAWA**	-3.319	I(1)	Hysteresis	22	KATSINA*	-4.43	I(0)	Structuralists
4	AKS **	-3.027	I(1)	Hysteresis	23	KEBBI*	-6.827	I(2)	Hysteresis
5	ANAMBRA*	-8.064	I(2)	Hysteresis	24	KOGI**	-3.315	I(1)	Hysteresis
6	BAUCHI**	-3.046	I(1)	Hysteresis	25	KWARA**	-3.207	I(1)	Hysteresis
7	BAYELSA**	-3.014	I(2)	Hysteresis	26	LAGOS*	-5.248	I(1)	Hysteresis
8	BENUE*	-4.144	I(0)	Structuralists	27	NASSARA*	-9.168	I(2)	Hysteresis
9	BORNO**	-3.273	I(1)	Hysteresis	28	NIGER*	-9.123	I(2)	Hysteresis
10	CRS**	-3.349	I(0)	Structuralists	29	OGUN*	-6.889	I(2)	Hysteresis
11	DELTA*	-5.548	I(2)	Hysteresis	30	ONDO**	-3.073	I(1)	Hysteresis
12	EBONYI**	-3.014	I(1)	Hysteresis	31	OSUN**	-2.914	I(0)	Structuralists
13	EDO*	-6.496	I(2)	Hysteresis	32	OYO***	-2.626	I(1)	Hysteresis
14	EKITI***	-2.723	I(0)	Structuralists	33	PLATEAU*	-9.143	I(2)	Hysteresis
15	ENUGU**	-2.957	I(1)	Hysteresis	34	RIVERS***	-2.87	I(1)	Hysteresis
16	FCT*	-3.863	I(0)	Structuralists	35	SOKOTO**	-2.711	I(0)	Structuralists
17	GOMBE *	-9.346	I(2)	Hysteresis	36	TARABA*	-6.443	I(2)	Hysteresis
18	IMO***	-2.793	I(1)	Hysteresis	37	YOBE*	-8.872	I(2)	Hysteresis
19	JIGAWA***	-2.794	I(1)	Hysteresis	38	ZAMFARA*	-8.008	I(2)	Hysteresis

Notes: * significant at 1%, ** significant at 5%, *** significant at 10%

Critical Values of ADF without trend 1% -3.508, 5% -2.896 10% -2.585

NASSARA is NASSARAWA state, CRS is CROSS RIVER State, AKS is AKWA IBOM State.

Table 4.2: Results of unit root tests with endogenous structural breaks

SN	Country/State	τ -STATS	Break Date	SN	State	τ -STATS	Break Date
1	NIGERIA	-6.562*	1996:4	20	KADUNA	-5.975**	2001:3,2004:3
2	ABIA	-5.247	1996:3	21	KANO	-5.604***	2008:2,2001:2
3	ADAMAWA	-5.765**	2008:3	22	KATSINA	-5.815**	1998:4
4	AKS	11.745*	1999:4, 2007:4	23	KEBBI	-5.097	1999:3
5	ANAMBRA	-5.386***	1995:4	24	KOGI	-5.604***	2000:3
6	BAUCHI	-5.79**	1998:4	25	KWARA	-5.366***	2006:3
7	BAYELSA	-12.996*	2010:1	26	LAGOS	-8.322*	2002:3
8	BENUE	-5.705*	2001:2	27	NASSARA	-5.338***	1998:1
9	BORNO	-5.912*	2007:3	28	NIGER	-6.601*	1998:3,2004:3
10	CRS	-5.475***	1995:4,2001:4	29	OGUN	-4.916	1996:3
11	DELTA	-7.929*	1999:3,2004:3	30	ONDO	-4.363	1999:4
12	EBONYI	-5.041	2003:3,2005:2	31	OSUN	-6.437**	2007:4
13	EDO	-9.079*	2003:2,2006:3	32	OYO	-6.134**	2007:4
14	EKITI	-6.463*	1999:3	33	PLATEAU	-4.407	2002:3
15	ENUGU	-6.319*	1995:4,2006:3	34	RIVERS	-5.936**	2000:2,2008:1
16	FCT	-5.185	2005:3	35	SOKOTO	-6.019**	1996:4
17	GOMBE	-6.513*	2007:3	36	TARABA	-7.361*	1999:3,2004:4
18	IMO	-4.506	1996:3	37	YOBE	-5.599***	2009:4
19	JIGAWA	-5.121	1996:4	38	ZAMFARA	-6.518*	1999:4,2006:4

Notes: * significant at 1%, ** significant at 5%. *** significant at 10%

Critical Values : 1% -6.450 5% -5.670 10% -5.310. The critical values are taken from Lee & Strazicich(2003), Model C, Table 2.

Results from unit root tests with breaks are presented in Table 4.2. We find that the national unemployment rate and those of 30 states reject the unit root hypothesis with breaks and hence are confirmatory of the structuralists thesis. Only the unemployment rates of eight(8) states are found to exhibit unit root in the presence of structural breaks. The 8 states include Abia, Ebonyi, and Imo (South East), Jigawa and Kebbi(North West), FCT and Platea(North Central), Ogun and Ondo(South West) states . The behavior of their unemployment rates are consistent with the hysteresis school. This means that cyclical fluctuations induced by business cycles have permanent effect on unemployment in these eight (8)states. For these states, individuals who have been unemployed for long periods are likely to remain unemployed, since their skills eventually decline.

However the behavior of unemployment rates of the majority of the states (29) and national unemployment rate of Nigeria is consistent with the structuralists thesis. Shocks to unemployment rate have no permanent effect. They are temporary and tend to converge to the natural rate of unemployment in the long run. Compared to the results in Table 4.1 the results in Table 4.2 reveal that the degree of persistence of the unemployment rate decreases when breaks are allowed.

From the results we can identify four main clusters of regions indicated by presence of common structural breaks which are evidence of existence of interrelationship in their respective local labour markets.

Cluster A: 1995-1996 Nigeria, Anambra, Enugu, Cross River (CRS).

Cluster B: 1998-2001 Akwa Ibom, Bauchi, Benue, Cross River, Delta, Ekiti, Kaduna, Kano, Katsina, Kebbi, Kogi, Ondo, Nassarawa, Niger, Rivers, Taraba, Zamfara.

Cluster C: 2003-2005: Edo, Ebonyi, Enugu, Delta, FCT, Kaduna, Kwara, Lagos, Niger, Plateau, Taraba, Zamfara.

Cluster D: 2008-2010: Adamawa, Akwa Ibom, Bayelsa, Borno, Gombe, Kano, Osun, Oyo, Rivers, Yobe.

These break points are associated with four important events, the movement from regulation to deregulation in 1995, the transition from military dictatorship to civilian democratic government in 1999, the adoption of national economic emancipation and development strategy in 2003 and recapitalization and consolidation in banking of 2004/2005 which led to the collapse of many banks and attendant retrenchment of staff in the sector, and finally the global financial crisis of 2007/2008 which impacted negatively on the Nigerian economy.

Table 4.3: Convergence Results with Fractional Integration

SN	State	Intercept	Trend	FI(d)	AR1	AR2	MA1	MA2
1	ABIA	-0.059		0.508	1.144	-0.516	0.109	-1.116
		(-1.688)		(3.062)	(7.017)	(-4.068)	(7.93)	(-83.52)
ARFIMA (2,d,2) LogLKL -79.53 SBIC -95.12								
2	ADAMAWA	9.592	-0.208	-0.44	1.718	-0.894	-0.061	
		(42.75)	(-34.17)	(-2.083)	(18.73)	(-11.33)	(-0.294)	
ARFIMA (2,d,1) LogLKL -99.43 SBIC -115.02								
3	AKWA IBOM	5.938	-0.137	-0.394	1.921	-1.005		
	ARFIMA(2,d,0)	(10.73)	(-7.77)	(-1.681)	-27.91	(-13.82)		
ARFIMA (2,d,0) LogLKL -85.63 SBIC -98.996								
4	ANAMBRA	5.163		-0.043	1.822	-0.895		
		8.747		(-2.560)	19.96	(-10.87)		
ARFIMA(2,d,0) LogLKL -63.43 SBIC -74.565								
5	BAUCHI	5.802		1.05	0.665			
		(773.63)		(4.692)	(12.56)			
ARFIMA(1,d,0) LogLKL -160.04 SBIC -168.97								
6	BAYELSA	-2.029		1.106	0.671			
		(-33.29)		(3.070)	(11.34)			
ARFIMA(1,d,0) LogLKL -323.8 SBIC -332.73								
7	BENUE	9.132		1.073	0.686			
		(23.85)		(4.87)	(12.97)			
ARFIMA(1,d,0) LogLKL -129 SBIC -137.96								
8	BORNO	2.98		0.816	0.756			
		(65.20)		(2.558)	(7.224)			
ARFIMA(1,d,0) LogLKL -87.415 SBIC -99.55								
9	CROSS RIVER	2.988		1.097	0.725			
		(260.29)		(9.747)	(15.498)			
ARFIMA(1,d,0) LogLKL -60.99 SBIC -69.92								
10	DELTA	2.95	-0.058	1.026	0.66			
		(20.3)	(-0.19)	(5.529)	(21.84)			
ARFIMA(1,d,0) LogLKL -106.72 SBIC -117.86								
11	EBONYI	7.8		1.058	0.699			
		(2108.2)		(5.644)	(15.312)			
ARFIMA(1,d,0) LogLKL -87.71 SBIC -96.04								
12	EDO	3.026		1.908				
		151.74		28.44				
ARFIMA(0,d,0) LogLKL -88.39 SBIC -95.1								
13	EKITI	1.017		1.75				
		35.96		7.689				
ARFIMA(0,d,0) LogLKL -112.64 SBIC -119.36								
14	ENUGU	7.863		1.109	0.737			

		866.88		9.748	16.968			
	ARFIMA(1,d,0)	LogLKL	-90.73	SBIC	-99.65			
15	FCT	2.872		1.834				
		(27.15)		(13.025)				
	ARFIMA(0,d,0)	LogLKL	-106.23	SBIC	-112.95			
16	GOMBE	5.801		1.057	0.665			
		(775.9)		(6.766)	(17.054)			
	ARFIMA(1,d,0)	LogLKL	-146.97	SBIC	-155.9			
17	IMO	0.027		1.759				
		(0.235)		(7.049)				
	ARFIMA(0,d,0)	LogLKL	-129.68	SBIC	-136.398			
18	JIGAWA	1.883	-0.476	0.805	0.744			
		13.11	-1.052	2.326	13.62			
	ARFIMA(1,d,0)	LogLKL	-86.796	SBIC	-100.19			
19	KADUNA	3.581	-0.118	0.753	0.768		-0.273	
		2.44	-0.586	1.742	14.71		-0.819	
	ARFIMA(1,d,1)	LogLKL	-102.51	SBIC	-121.44			
20	KANO	1.985		0.958	0.612			
		(5.851)		(2.025)	(16.45)			
	ARFIMA(1,d,0)	LogLKL	-181.27	SBIC	-192.44			
21	KATSINA	-0.0191		1.051	0.677			
		(-0.869)		(4.629)	(14.063)			
	ARFIMA(1,d,0)	LogLKL	-154.97	SBIC	-163.9			
22	KEBBI	4.941		1.064	0.677			
		(30.674)		(3.431)	(15.77)			
	ARFIMA(1,d,0)	LogLKL	-141.77	SBIC	-152.94			
23	KOGI	-0.018		1.125	0.679			
		(-1.026)		(7.896)	(16.08)			
	ARFIMA(1,d,0)	LogLKL	-94.3	SBIC	-103.23			
24	KWARA	-0.026		1.05	0.659			
		(-1.235)		(3.467)	(18.3)			
	ARFIMA(1,d,0)	LogLKL	-175.65	SBIC	-184.58			
25	LAGOS	2.979		1.077	0.67			
		(145.76)		(5.471)	(22.17)			
	ARFIMA(1,d,0)	LogLKL	-126.76	SBIC	-135.69			
26	NASSARAWA	0.999		1.146	0.806			
		(199.85)		(13.35)	(5.91)			
	ARFIMA(1,d,0)	LogLKL	-76.93	SBIC	-85.86			
27	NIGER	5.997		1.152	0.738			
		(663.39)		(17.44)	(6.587)			
	ARFIMA(1,d,0)	LogLKL	-119.76	SBIC	-128.69			

28	OGUN	6.047		1.148	0.646			
		(92.03)		(6.57)	(13.23)			
	ARFIMA(1,d,0)	LogLKL	-85.21	SBIC	-94.14			
29	ONDO	2.038		1.11	0.716			
		(37.56)		(8.01)	(7.469)			
	ARFIMA(1,d,0)	LogLKL	-67.877	SBIC	-76.81			
30	OSUN	6.01		1.213	0.714			
		(307.33)		(23.45)	(9.29)			
	ARFIMA(1,d,0)	LogLKL	-88.29	SBIC	-97.22			
31	OYO	6.221		0.774	0.7226		-0.283	
		(12.033)		(1.868)	(24.421)		(-0.892)	
	ARFIMA(1,d,1)	LogLKL	-76.43	SBIC	-87.6			
32	PLATEAU	2.094		0.9097	0.7599		-0.182	
		(9.263)		(1.938)	(18.8)		(-0.537)	
	ARFIMA(1,d,1)	LogLKL	-92.289	SBIC	-103.45			
33	RIVERS	-1.801		1.008	0.629			
		-78.22		3.59	12.52			
	ARFIMA(1,d,0)	LogLKL	-145.11	SBIC	-154.05			
34	SOKOTO	6.025		1.143	0.735			
		(178.15)		(10.77)	(12.52)			
	ARFIMA(1,d,0)	LogLKL	-109.79	SBIC	118.72			
35	TARABA	9.071		1.0696	0.6697			
		(89.99)		(4.034)	(19.61)			
	ARFIMA(1,d,0)	LogLKL	-180.04	SBIC	-188.98			
36	YOBE	4.044		1.114	0.698			
		(58.34)		(5.46)	(13.23)			
	ARFIMA(1,d,0)	LogLKL	-77.04	SBIC	-85.97			
37	ZAMFARA	4.995		1.12	0.718			
		(320.59)		(8.017)	(10.26)			
	ARFIMA(1,d,0)	LogLKL	-179.18	SBIC	-188.11			

Notes: values in brackets are t-values; LKL=loglikelihood ratio; SBIC=Schwarz bayesian information criterion

Table 4.3 presents the results for convergence test. First we find that two (2) states (Adamawa and Akwa Ibom) display rapid catching-up or short memory catching-up given that the trend coefficient is negative and statistically significant and the fractional integration parameter is less than zero. One state, Anambra exhibits strict conditional convergence. But seven states (7) namely Abia, Borno, Kaduna, Kano, Jigawa, Plateau and Oyo show long memory but mean-reverting conditional convergence with the national unemployment rate. The implication of

conditional convergence is that each state approaches its own steady-state unemployment rate. Keeping the differentials with national rate constant. Twenty seven (27) states show absolute divergence from the national unemployment rate. These include: Bauchi, Yobe and Taraba (North-East), Sokoto and Zamfara (North-West), Bayelsa, Cross River, Delta, Edo, Rivers (South-South), Ebonyi (South-East), Ekiti, Lagos, Ogun, Ondo and Osun (South-West), Benue, Kogi, Kwara and Niger (North-Central). These states cut across the six geo-political zones in the country. Overall the results show that the unemployment rate among most of the Nigerian states do not show any tendency of convergence towards the national average. One of the reasons for this is the uniform level of minimum wage which is relatively high compared to labour productivity in economically lagging poor states. Policies aimed at reducing relative unemployment differences are not likely to make much impact in Nigeria unless they are sufficiently large.

VI Concluding Remarks

Given the spate of bombings, kidnapping, armed robbery and terrorism in Nigeria there has been renewed efforts to tackle the high unemployment rate in the country. This is more so because vast differences in unemployment rates among the states are indicative of regional economic inequality and poverty. This paper investigates the dynamics of unemployment rates among the states in Nigeria and the prospects for convergence with the national rate.

We use more theoretically defensible unit root testing with structural breaks and the autoregressive fractional integrated moving average (ARFIMA) approach. Our results show that behavior of unemployment rates of thirty(30) states are consistent with the structuralists/NAIRU thesis given that they are stationary with breaks. We identify four clusters of break points 1995/96, 1998-2001, 2003-2005 and 2008-2010 which correspond respectively with confusing policy signals of deregulation, regulation and deregulation between 1993 and 1995 and the attendant distress in the financial sector, the change from military dictatorship regime to civilian democratic governance in 1999, the failure of NEEDS and the

implementation of banking policy of recapitalization and consolidation in 2004/2005, the global financial crisis in 2008 which affected Nigeria negatively.

We also investigate the prospects for convergence in relative unemployment rate among the states. We find some evidence of a process of conditional convergence among ten states with the national unemployment rate. The states include Anambra, Adamawa, Akwa Ibom, Abia, Borno and Kaduna. Others include Kano, Jigawa, Plateau and Oyo states. Adamawa and Akwa Ibom states display rapid catching-up or short memory catching-up. However we find some evidence of non-convergence among 27 states. For these states the fractional integration parameter d exceeded unity. The divergence pattern observed in unemployment differentials among most of the states is a consequence of hysteresis in the unemployment rates of some states. The fact that ten states display stochastic convergence suggests that at least part of Nigeria is converging. This means that poorer states are on the average catching-up to the national unemployment rate.

The non convergence of relative unemployment differentials of most of the states is indicative of the long lasting problem of unemployment which may not go away. Policies aimed at reducing relative unemployment differences are likely to make much impact when they are substantial. These include substantial investment in infrastructural rehabilitation in electricity, road and rail network, development of entrepreneurial skills among the youth and government provision of start-up grant or loans to build private businesses.

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Figure 3.3: Map of the 36 States and Abuja in Nigeria

