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PRODUCTIVITY GROWTH AND UNEMPLOYMENT RATE: NIGERIA IN FOCUS

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ABSTRACT

Nigeria is battling high unemployment, which has become increasingly more devastating following the country over dependent on a single commodity (oil) and high population growth rate. Widespread corruption has occurred, and there has been a surge in the number of graduates with the increase in the establishment of both public and private polytechnics and universities. Therefore, this study seeks to investigate whether the long-run relationship between productivity growth rate and the unemployment rate is relevant to Nigeria for the period 1991-2016. The Pearson Product Moment Correlation test procedure was applied to determine the association between productivity growth rate and the unemployment rate.The result indicates that there is no significant positive long-run association between productivity growth rate and the unemployment rate(r = .347, n = 26, p = .082). The paper concludes that government economic policies should be geared towards boosting productivity and employment.

KEYWORDS: *Productivity, Growth Rate, Unemployment, Nigeria*

INTRODUCTION

The persistent poverty in Nigeria is an indication of the country's failure to deal effectively with unemployment, low productivity and income inequality. A low unemployment rate and rapid productivity growth are the yardsticks of a successful nation, and it remains the focal point of economic policy. Nigeria is one of the Sub Saharan Africa's largest economies and depends heavily on oil as its main source of foreign exchange earnings and government revenues. Economic diversification efforts of the government have not brought about strong growth that translates into a significant decline in poverty levels as over 62% of Nigeria's 170 million people still live in extreme poverty (CIA World Face book, 2017). In 2016, Nigeria's economy slipped into recession for the first time in more than two decades reflecting adverse economic shocks. Global oil prices reached a 13-year low, resulting in the severe contraction of oil GDP. Although the oil sector represented only 8.4 percent of GDP in 2016, lower foreign exchange earnings from oil exports had spillover effects on non-oil sectors that depend on imports of inputs. This led to the overall real GDP contracted by 1.5 percent (World Bank report, 2017).

RESEARCH PROBLEM

The unemployment rate remains increasingly high in Nigeria. It is a paradoxical economic fact that low unemployment rates can disguise substantial poverty in a country, while high unemployment rates can occur in countries with a high level of economic development and low rates of poverty. Nigeria does not have an unemployment welfare programme, and as such her people eke out a living in vulnerable employment. This high and sustained unemployment indicates serious inefficiencies in resource allocation. Young men and women today face increasing uncertainty in their

hopes of achieving a satisfactory transition in the labour market, and this uncertainty and disappointment have negative effects on individuals, communities, economies and Nigeria at large. Unemployed or underemployed youth are a handicap to contributing adequately to national development as they possess abysmal spending power as consumers, and less to invest as savers. Again, this high rate of youth unemployment and underemployment prevent foreign investors from investing in Nigeria, and also hinders Nigerian local investors from developing competitive advantages based on human capital investment, thus threatening future hope of development.

The unemployment rate is driven to a major extent by the pace of economic growth. What seems to be critically important in reducing the unemployment rate is the size of the output gap; that is the rate of actual output growth compared with the rate of potential output growth. Potential output is a measure of the economy's capacity to produce goods and services when resources (e.g, labour) are fully utilized. The growth rate of potential output is a function of the growth rates of potential productivity and the labour supply when the economy is at full employment. Since unemployment rates can disguise substantial poverty in a country, while high unemployment rates can occur in countries with a high level of economic development and low rates of poverty, therefore, the crux of this study is to investigate the relationship between Gross Domestic Product (GDP) and the unemployment rate in Nigeria.

REVIEW OF RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Conceptual Review of Productivity Growth and Unemployment Rate

The frequently used concept in the theoretical analysis of the labour market and of long-run unemployment is "natural unemployment". A scholar of repute called Friedman (1968) views natural unemployment as "the level which would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labour and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on (Friedman 1968, p. 8)". However, the popular interpretation of the natural rate of unemployment is that it is a long-run equilibrium that the economy strives to attain over time. This idea has had considerable impact in academic research.

Another dimension to the concept of productivity is called "labour productivity." It is a revealing economic indicator which offers a realistic measure of economic growth, competitiveness, and living standards within an economy. It is the measure of labor productivity, which helps to explain the principal economic foundations that are necessary for both economic growth and social development. In general, labor productivity is equal to the ratio between a measure of output volume, which is the gross domestic product (GDP) and a measure of input use (US Departmentof Labour). In macroeconomics the Gross Domestic Product (GDP) is widely used as a measure of the economic growth of nations and industries (Paul, 1994). GDP is the income available for paying capital costs, labor compensation, taxes and profits (OECD, 2008). At times, some economists normally use gross value added (GVA) because there is always a strong correlation between GDP and GVA (Freeman 2008).

GDP per capita is a rough measure of average living standards or economic well-being and is one of the core indicators of economic performance (OECD, 2008). Uhlig (2006) avers that all, the correlation between productivity growth and unemployment are positive, less volatile and more persistent such that this correlation varies with the span of time under consideration. Thereby, buttressing that technical progress and growth in gross domestic production (GDP) are

certainly not harming employment and over most periods creates and kept employment. Cohere, Dickers and Pogen (2001) suggest that the new economy, features production processes that put a greater emphasis on general rather than specific skills which as a result make workers to become more interchangeable in order to enhance easy to match workers and jobs which in turn reduce unemployment. In the same vein, Grubb, Jackman and Layard (1982) and Braun (1984) put forth an explanation that the link between unemployment and productivity rest on what he described as "wage aspirations" which adjust slowly to shift in productivity growth. Though, the concept of wage aspirations is a departure from the neoclassical theory of the labor market, but it builds on research by psychologists and industry relations specialists.

In the view of Mortensen and Pissarides (1998), productivity growth increases the value of a worker to the firm by means of gearing the creations of job vacancies which turn, causes unemployment to decline and otherwise known as the *capitalization effect*. On the other hands, they put forth the fact that higher productivity growth has the potentials to be accomplices by structural change. This is because old jobs are destroyed and replaced by new ones. Hence, referred to as the "*creative destruction effect*" The result of the aforementioned is that productivity acceleration would shorten employment duration and at the end raise the natural rate of unemployment. Although the identified correlation would be as a result of the linkage between productivity growth and unemployment, this is largely a function of the relative size of the above mentioned effects.

Wakeford (2004) posits that there exists a rising increase in productivity, which impact on employment positively via its contribution to higher output signifying an increasing demand for labor hence reducing the unemployment rate all things being equal. Adam (2002) and Lee (2000); Schnabel, 2002) posit that a drop in the unemployment rate is expectedly required to induce an increase in the labor participation rate, through hours worked and productivity thereby resulting in an increase in output at large. Manuelli (2000) posits that an anticipated improvement in technology reduces the market value of existing firms, which causes firms to cut back on investment and job creation. As such, the unemployment rate goes up. Once the new technology becomes available, firms begin to increase investment and create more jobs, causing the unemployment rate to fall.

Theory of Productivity Growth and Unemployment Rate

Okun's Law

Okun's law (1962), states that a fall in unemployment rate to 1% will result in an increase in output by 3%. As a byproduct of his study of potential and the natural rate, Okun discovered a strong empirical relationship between output growth and changes in the unemployment rate. He uncovered a relationship between the actual level of output and its potential on one hand, and a relationship between unemployment and its natural rate on the other hand. Therefore, Okun avers that the growth of actual output must consistently surpass that of the potential output in an economy so as to reduce unemployment. This Law has been used in policy making. Okun's law is a back-of-the-envelope method of translating changes in production to changes in the unemployment rate (Ball, Leigh, and Loungani, 2013). To test the relevance of this theory to Nigerian economy, it is hypothesized thus:

H_0: There is no significant positive relationship between gross domestic product (GDP) growth and unemployment rate in Nigeria.

H_1: There is a significant positive relationship between gross domestic product (GDP) growth and unemployment rate in Nigeria.

Unemployment in the Augmented Solow Growth Model

Aiming at the interaction between long-run (equilibrium) unemployment and productivity growth, Pissarides (1998) Modern labour market theory provides at least three competing models to explain equilibrium unemployment as follows: Union Models; this is where wages are determined by a bargain between unions and firms; Search Models: this is where the wage is determined by a bargain between individual workers and firms; and Efficiency Wage Models: This is where firms set wages above the competitive level to increase workers efforts. Even though the reasoning behind these models differs, two important results of the models are very similar: first, the equilibrium rate of unemployment is determined by institutional settings, such as the size and power of unions, the bargaining system, and by the generosity of the unemployment insurance system. On-the-job search allows faster growth to reduce unemployment by increasing job creation and decreasing job separation. When the productivity growth rate rises, on-the-job search generates more vacancies by accelerating the reallocation of workers.

Specifically, when growth accelerates, the search effort of employed and workers rises, making it easier for firms to find a worker, which increases the value of new jobs. This induces more job creation and lowers unemployment. Furthermore, on-the-job search reduces job separation by increasing the value of the firm-worker match when the growth rate rises. In the model, workers in firms with low productivity jobs search for better jobs. Since the worker shares some of the expected bene.t of search with the firm through the wage, the job has become more resistant to negative shocks, leading to lower job Separation (Hiroaki and Yuya 2011).

The Search and Matching Theory

This theory by Terry (1998) is based on the assumption that workers have different skills, and that jobs have different skill requirements, hence workers need to find well-paying, desirable jobs, while firms need to find the most productive workers. Neither firms nor workers have all the information they need about the options available to them, so they must engage in a search. Since search is costly and time-consuming, both firms and workers must use some of their resources to find a good match. Workers are assumed to search only when they are unemployed. Workers and firms both face uncertain environment. When a worker gets a wage offer, for instance, she must decide whether to accept it or continue searching for a better offer. Accepting the offer means foregoing the chance of a higher wage offer later, while continuing the search means losing the wages the worker would have earned if the worker had accepted the offer and started working. The wage at which the worker is indifferent between continuing the search and accepting the current job is called the *reservation wage*. The worker accepts all job offers above this wage and turns down all offers below it. When a search is successful (when there is a match between the needs of the worker and the firm) the worker leaves unemployment. However, existing matches sometimes fall apart, which leads to the worker becoming unemployed. At the equilibrium unemployment rate, the number of workers leaving unemployment equals the number of workers becoming unemployed. To ameliorate the hassles of the search, Gomme (1998) posts that the internet now made it easy for firms to now routinely post vacancies on the internet, so that workers can look for jobs in multiple locations at almost no cost.

Theory of Effective Demand

This theory developed by Malthus, Marx Veblen, and Keynes (1936) is based on the assumption that unemployment is an involuntary phenomenon. Keynes posits that unemployment is cyclical which is generated by deficiency of aggregate demand. According to him, capitalists hire workers and invest such labor to produce when they are optimistic about the economy (profit making). To him, if expectations about the future are supported by the economic reality, investments will be increasing such that employment will continue to rise until the equilibrium condition is reached. This equilibrium is reached at the point of intersection between aggregate demand and supply. However, the point of effective demand may be less than the full employment equilibrium if expectation about the future of the economy is not favourable as the capitalists will reduce investment thereby making unemployment to rise. This unemployment is due to the deficiency of aggregate demand, particularly investment expenditure.

Review of Relevant Past Empirical Studies

Keshmeer and Nnanna (2015) sought to determine whether a long run association between growth and unemployment is relevant to Fiji for the period 1982-2012. Johansen Co integration test procedure was applied to ascertain the association among growth, investment and unemployment. The result confirmed the evidence of a long - running association between unemployment and growth, with cointegration running from investment and unemployment to increase in economic output. They concluded that economic policies should be geared towards improving investment.

Michael and Markus (2000) investigated the relationship between a country's level of unemployment and long-run growth rate. They incorporate unemployment into a generalized augmented Solow-type growth model. Using data from 13 OECD countries from 1960 to 1990 within a dynamic panel data framework, they found supportive evidence that an increase in unemployment indeed reduces the long-run level of productivity. Their results suggested that if unemployment would have remained at the level of 1960 then productivity today would be roughly 10% higher than it is.

Shatha, Thikraiat, and Ruba (2014) examined the relationship between unemployment and GDP growth in Arab countries. They considered 9 Arab Countries between 1994 and 2010. The model adopted for testing the relationship was the Pooled EGLS (Cross-section SUR). They found that economic growth has negative and significant effect upon the unemployment rate, which indicated that 1% increase in economic growth will decrease the unemployment rate by 0.16%.

Ball, Leigh, and Loungani (2012) investigated how well Okun's Law fits short-run unemployment movements in the United States since 1948 and in twenty advanced economies since 1980. They found that Okun's Law is a strong and stable relationship in most countries as it did not change substantially during the Great Recession. It was also discovered that the coefficient is the relationship; which is the effect of one percent change in output on the unemployment rate varies substantially across countries. They aver that this variation is partly explained by idiosyncratic features of national labour markets, but it is not related to differences in employment protection legislation. They concluded that Accounts of breakdowns in the Law, such as the emergence of jobless recoveries, are flawed.

Lopez-Villavicencio and Silva (2010) analyzed a macroeconomic panel of OECD countries between 1985 and 2007. They found that wage increases have exceeded productivity growth for permanent workers, while the reverse was the case for temporary workers in line with their lower bargaining power. Following inter-country variation of the share of temporary workers, they reasoned that this may be a factor for explaining why the existence and size of the

wage-productivity gap varies between countries.

Hiroaki and Yuya (2011) evaluated the impact of long-run productivity growth on job finding and the unemployment rate, using a search and matching model. They incorporate disembodied technological progress and on-the-job search into the endogenous job separation model of Mortensen and Pissarides (1994). They posit that incorporation of on-the-job search allows faster growth to reduce unemployment by decreasing the separation rate and inducing job creation. They discovered this by demonstrating that by introducing on-the-job search substantially improved the ability of the Mortensen and Pissarides model to explain the impact of growth on unemployment. Their quantitative analysis showed that their model increased the magnitude of the negative impact of growth on unemployment compared to the standard matching model with disembodied technological progress.

IrfanLal et al. (2010), estimated the Okun's coefficient, and checked the validity of Okun's law in some Asian countries. They used the time series annual data during the period 1980-2006 and employed the cointegration technique to find out long run association between variables and error correction mechanism (ECM). The empirical result showed that Okun's law interpretation is not valid in some Asian developing countries.

Bean and Pissarides (1993) examined cross-country correlations between growth and unemployment in OECD countries from 1955-1985. They found that there is no clear cross correlation between unemployment and productivity growth across OECD economies, except from 1975 to 1985, when they find a weak negative correlation.

Caballero (1993) used time series data on growth and unemployment in the U.S. and the U.K. between 1966 and 1989. He found that correlation between these two series is not clear, but that at medium frequency, there was weak evidence of a positive relationship in both countries. Pierdzioch et al. (2009) used data covering the period 1989-2007 for G7 countries to test the relevance of Okun's law to professional economists' forecasts of output growth and unemployment. Their results confirmed the consistency between Okun's law and professional economists' forecasts of changes in unemployment rate and the real output growth rate. They also found a direct relationship between magnitude of unemployment and the size of the output gap.

So far available literature reveals that Okun's law has been probed into in several countries where the gap between real output and unemployment is considerably wide. As such, it is pertinent to empirically investigate the validity of this Okun's law in Nigeria to discover whether the law is consistent with productivity growth and unemployment rate.

METHODOLOGY

Research Design

This study employed exploratory research design. It is vital for discovering ideas and insights into the natural phenomena (Ezejelue, Ogwo & Nkamnebe, 2008).

Sources of Data

The study used the annual time series data of Nigeria's unemployment rate for the period 1991-2016 (ILO, 2017) and GDP growth rate for the same period 1991- 2016 (World Bank, 2017). See (Table 1 & 2)

Method of Data Analysis

Pearson's product moment correlation which measures relationship between variables was used in carrying out

the analysis to determine if gross domestic product (GDP) growth is relevant to unemployment rate in Nigeria. According to Cohen, Manion, & Morrison (2004), it is a statistical value that ranges from -1.0 to +1.0 and express the relationship in a quantitative form. The coefficient is usually a decimal value which falls within the range of -1.0 to +1.0. The closer the coefficient is to -1.0 or +1.0, the stronger the relationship of the variables involved. The hypothesis was tested at 5% level of significance.

Test of Hypothesis Result

H_0: There is no significant positive relationship between gross domestic product (GDP) growth and unemployment rate in Nigeria.

H_1: There is a significant positive relationship between gross domestic product (GDP) growth and unemployment rate in Nigeria.

The Pearson product-moment correlation analysis in the table above indicates that there is no significant positive relationship between GDP growth rate and unemployment rate in Nigeria (r =.347, n = 26, p =.082). (See Table 3)

DISCUSSION OF FINDINGS

The result from Pearson product-moment correlation analysis, using the time series annual data during the period 1991-2016, indicates insignificant association between GDP growth rate and unemployment rate in Nigeria (r =.347, n = 26, p =.082) which signifies that Okun's law interpretation is not applicable to Nigeria. This result confirms earlier study by Shatha et al (2014) who examined the relationship between unemployment and GDP growth in Arab countries and found that 1% increase in economic growth decreased the unemployment rate by 0.16%. Also corroborating this finding is the study by Michael et al (2000) who investigated the relationship between a country's level of unemployment and long-run growth rate and found that an increase in unemployment indeed reduces the long-run level of productivity. Equally supporting this the assert by Wakeford (2004) avers that a rising increase in productivity will impact on employment positively via its contribution to higher output which signifies an increasing demand for labour which will ultimately reduce the unemployment rate all things being equal. Adam (2002), Lee (2000) and Schnabel (2002) posit that a drop in the unemployment rate is expectedly required to induce an increase in the labour participation rate, through hours worked and productivity thereby resulting to an increase in output at large.

RECOMMENDATION

- It is recommended that government should vigorously pursue the diversification of the nation's economy into agriculture.
- Nigerian government should fully deregulate the economy so as to make it private driven in order to free up resources for infrastructural development, which in turn supports investment and employment.

Competing Interests

The author declares that he has no financial or personal relationships that may have inappropriately influenced him in writing this article or the results.

LIST OF TABLES

Table 1: Unemployment Rate and GDP Growth Rate of Nigeria (1991-2016)

Year	GDP Growth Rate (%)
1991	-0.618
1992	0.432
1993	2.09
1994	0.91
1995	-0.307
1996	4.994
1997	2.802
1998	2.716
1999	0.474
2000	5.318
2001	4.411
2002	3.785
2003	10.354
2004	33.736
2005	3.445
2006	8.211
2007	6.828
2008	6.27
2009	6.934
2010	7.84
2011	4.887
2012	4.279
2013	5.394
2014	6.31
2015	2.653
2016	1.541

Source: World Bank annual GDP growth Rate of Nigeria (2017)

Table 2: Unemployment Rate and GDP Growth Rate of Nigeria (1991-2016)

Year	Unemployment Rate (%)
1991	5.944
1992	6.186
1993	6.2
1994	6.207
1995	6.251
1996	6.874
1997	4.629
1998	5.239
1999	5.927
2000	6.702
2001	6.777
2002	6.853
2003	6.931
2004	7.011
2005	7.057
2006	7.102
2007	7.147
2008	7.192
Table 2: Cont…	
2009	7.238
2010	7.286
2011	7.334

2012	7.6
2013	7.1
2014	4.8
2015	4.275
2016	5.005

Source: ILO Annual Unemployment Rate of Nigeria (2017).

Table 3: Correlations

Unemployment Rate (%)	GDP Growth Rate (%)
Pearson Correlation	1.347
Unemployment Rate (%) Sig (2-tailed).	082
N	26 26
Pearson Correlation	.347 1
GDP Growth Rate (%) Sig (2-tailed).	082
N	26 26

Source: Researcher's computation, 2017

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