Determinants of Unemployment in Nigeria

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A b s t r a c t

The main focus of this research study is to look into the determinants of unemployment in Nigeria. Based on theoretical underpinnings four explanatory variables were included in this study which are; gross fixed capital formation, exchange rate, interest rate and inflation rate (CPI based) in order to evaluate their impact on the trend of unemployment rate. Data for the study were obtained from the Central Bank of Nigeria statistical bulletin and were analyzed and tested using the error correction model (ECM). The result of the findings revealed that: there existed a significant relationship between unemployment rate and the explanatory variables selected in the study. It was recommended that an investment -friendly rate of interest is necessary for promoting economic growth; infrastructural decay should be addressed as infrastructural expenditure incurred by banks are passed to borrowers through interest rate

Keywords: Unemployment rate, GDP growth rate, Exchange rate, Inflation rate, Interest rate.

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Background to the Study
Technically speaking, unemployment is defined as a state of affairs when in a country there are a large number of able-bodied persons of working age who are willing to work but cannot find work at the current wage levels. People who are either unfit for work for physical or mental reasons, or don't want to work are excluded from the category of the unemployed.

Mere engagement in some productive occupation does not necessarily mean absence of unemployment. People, who are only partially employed or are engaged in inferior jobs, though they can do better jobs, are not adequately employed. It is called a state of underemployment which is equally bad for the prosperity of any country though under capitalism some amount of unemployment is inevitable. The International Labour Organization (ILO) defines unemployment as people who are: out of work, want a job, have actively sought work in the previous four weeks and are available to start work within the next fortnight; or out of work and have accepted a job that they are waiting to start in the next fortnight.

According to Ahuja (2011) we have three main types of unemployment: (1) structural unemployment which occurs when a labour market is unable to provide jobs for everyone who wants one because there is a mismatch between the skills of the unemployed workers and the skills needed for the available jobs, (2) frictional unemployment which is the time period between jobs when a worker is searching for, or transitioning from one job to another. It is sometimes called search unemployment and can be voluntary based on the circumstances of the unemployed individual. Frictional unemployment is always present in an economy; and (3) cyclical, deficient-demand, or Keynesian unemployment, occurs when there is not enough aggregate demand in the economy to provide jobs for everyone who wants to work, demand for most goods and services falls, less production is needed and consequently fewer workers are needed, wages are sticky and do not fall to meet the equilibrium level, and mass unemployment results.

Some of the very common causes of unemployment in Nigeria and other developing economies are lack of stock of physical capital, inequitable distribution of land, neglect of the role of agriculture in employment generation and lack of infrastructure. A decrease in the growth of economies because of the economic meltdown which started in October 2008 is a major reason of increasing rate of unemployment for both developed and developing countries of the world. According to theory, there is a positive relationship between employment and economic growth of countries.

Economic growth is a vital factor that affects unemployment. Theoretically a positive relationship should exist between growth and employment or vice versa. The economic theory, which discussed on the subject of the relationship between unemployment and economic growth, is known as Okun's law. He studied the trade off among the real GNP and unemployment. According to the theory, there is an inverse relationship between growth and unemployment (Dornbusch, Fischer, Startz 2008). The relationship between unemployment and inflation is termed as Philips curve in economic theory and was developed in 1958 by A. W. H. Philip (Blanchard and Johnson 2013). He discovered positive relationship between the two variables. Individually, inflation and unemployment have both negative effects on the individuals. With the globalization and trade openness, exchange rate has started playing a vital role in the economy which has a direct effect on unemployment level in a country. With

devaluation, exports tend to increase and as a result expenditure on import is reduced. By this inflow of foreign currency is enhanced, economies move towards growth and consequently the rate of unemployment declines.

Statement of Problem

Unemployment is a macroeconomic phenomenon that has been well documented in literature. Economists in history have had different views of the unemployment phenomenon, there have been various theories formulated by different schools of thought in regards to unemployment. For example, the Keynesian economists and Monetarists have had contrasting views about the unemployment problem.

In developing countries, unemployment is seen to be protracted rather than temporary. The high unemployment rate can be attributed to factors such as skills shortages, slow pace of economic reforms and deterrents to investment such as high interest rates. The unemployment problem has also had dire effects on the economy as a whole. The various attempts that have been made as means of alleviating the unemployment problem seem to have failed because the unemployment rate in the country continues to rise. This study therefore, aims to make policy recommendations that can be adopted as means of alleviating the unemployment problems based on the results of this investigation. Though a lot of work has been done on relationship between unemployment and other set of macroeconomic variables but less attention is paid to determinants of unemployment i.e. what are the major determinants of unemployment?

Objectives of the Study

In Nigeria gross fixed capital formation (investment), exchange rate, interest rate and inflation rate are important economic variables that determine unemployment. The key objectives of this study are:
1. To check the impact of investment on unemployment.
2. To analyze the effect of exchange rate on unemployment.
3. To analyze the effect of interest rate on unemployment
4. To check the impact of inflation rate on unemployment.

The Research Hypothesis

The research will be guided by the following hypothesis:
Ho: There exist no significant relationship between Unemployment and the determining variables selected.

Conceptual Literature

The concept of unemployment is a popular concept well understood by many people of various nations. The unemployment rate generally indicates the economic state of a country. In theory, the concept of unemployment seems straightforward however, in practice it is complicated because individuals have to be classified as employed, unemployed or out of the labour force by taking into consideration a lot of factors. In 1954, the International Labour Organisation (ILO) formulated a standard definition of unemployment that enabled countries to categorize individuals as either employed or unemployed. According to the ILO standards, a person is not employed if he or she is:· a) without work, b) currently available for work and c) seeking work.

Theory

In Classical economic theory, unemployment is seen as a sign that smooth labor market functioning is being obstructed in some way. The Classical approach assumes that markets behave as described by the idealized supply-and-demand model: the labor market is seen as though it were a single, static market, characterized by perfect competition, spot transactions, and institutions for double-auction bidding.

In this case "quantity" is not measured as a number of things (like houses or shoes) but rather a quantity of labor services. We can think of this quantity as being measured, for example, by the number of workers working full days over a given time period. The "price" of labor is the (real) wage (in this case, per day). Workers supply labor, while employers demand it. We assume that every unit of labor services is the same, and every worker in this market will get exactly the same wage.

Problems of Unemployment

The lack of jobs for qualified and willing individuals has become the scourge of modern capitalist and quasi-capitalist societies the world over (Nwankwo 1988). Undoubtedly, the duration of high level of unemployment in Nigeria has remained long over the years confirming the chronic situation of the unemployed. One salient way in which an unemployed is affected by this social malaise is in the realm of income. The loss of income which consequently makes living difficult placed the unemployed on the brink of life threatening poverty, facing crippling shortage of life's essentials, or the separation, vagrancy, begging and imprisonment which befall thousands of would-be workers.

Unemployment affects a person's health and that of his family. When someone, especially a breadwinner has been out of work for a long time, he is being pushed towards despair by two terrible forces. On one side is the issue of poverty, on the other side is the prospect of unemployed ability. Consequently, psychological imbalances set in, thus, unemployment induces extra strains which increases the probability that certain outcomes in the form of ill-health, poverty and crime will occur. (Aston 1986).

For the society at large, unemployment involves increasing costs in the form of lost production, healthcare and welfare benefits as well as social protests and dislocation. The costs to the society are quite enormous embracing monetary cost, health cost vis-a-vis physical health and mental health and crimes.

Other human costs of unemployment are psychological costs and the cost of increased crime. Employment as argued by Michel (1975) performs the latent function of satisfying our needs for social interaction, the deprivation of which reduces psychological well-being. Lack of job and especially abrupt disruption or termination of employment can be disruptive or even devastating. The skill of the individual is not left unaffected. Skills, in the opinion of Gilbert (1989), have never been given the chance to develop for lack of use. In terms of the cost of unemployment, it means that most of the direct cost of long term unemployment is carried by individual and their families through financial deprivation, poverty and ill-health. The economic costs are shouldered by the state.

Empirical literature

On the basis of information, collected from the existing articles, an attempt has been made to make an overview of the existing literature.

Tunah (2010) studied that macroeconomic variable which cause of unemployment for Turkey. Quarterly data from 2000 to 2008 is used as the sample data for the study. Augmented Dickey Fuller test (ADF), Phillip-Perron test, Johanse's cointegration and granger causality techniques were used for analysis. The results showed that there is a significant impact of real GDP, consumer price index and previous unemployment rate on the unemployment rate. Whereas real effective exchange rate has no impact on the unemployment.

Ozturk & Akhtar (2009) took a comprehensive approach to unemployment by using VAR of "Variance Decomposition and Impulse response function analysis". He was interested in studying interrelationship among Foreign Direct investment, Export, Gross Domestic product and unemployment in Turkey for the period of 2000-07. They found only two counteracting vectors in the system, showing long run relationship. They concluded that foreign direct investment did not lead to reduce unemployment in Turkey. GDP is positively affected by variations in exports but is insignificant. So they did not found any evidence of export led growth in Turkey. Again, Variations in GDP was no attached with reduction of unemployment.

Marika Karanassou.et.al (2007) analyzed labor market dynamically to find relationship between capital stock and unemployment. They used indirect transmission channels of the effects of capital stock for estimating single equation unemployment model. The major variables they used were interest rates and investment ratios. They introduced different approaches especially by direct estimation of the model of "Employment theory of Chain response" for the effects of capital stock on labor market. They concluded that capital stock is the key determinant of unemployment.

El-Agrody et al. (2010) examined the economic study of unemployment and its impact on the GDP for Egypt. Data was collected from year 1994 to 2004. Simple and multiple linear regression analysis were applied. Variables used in the study were privatization, population, consumption expenditure, interest rates, exchange rates, technology, agricultural domestic product, real wage rates and agricultural investment. The results showed that there is a significant positive impact of national unemployment, national investment, exchange rate and average per capita share of GDP on the volume of GDP. The results also highlighted privatization and increasing population as the main reasons of increasing unemployment. They recommended that privatization policies need to be revised and to reduce interest rates in order to lowering the agricultural unemployment.

Kupets (2005) studied determinants of unemployment in Ukraine between 1997 & 2003. He used Ukrainian Longitudinal Monitoring Survey 2003, to investigate an individual conditional probability about leaving unemployed to employ. Effects of unemployment benefits on unemployment were not confirmed. Again, Multivariate analysis suggested that long term unemployment reduction policies should focus more on less educated & older workers and residents of rural areas.

Mark C. Foley (1997), Russian people's longitudinal survey for studying determinants of unemployment in early stages of economic transition in Russia. He used a discrete-time waiting model along with competing risk and heterogeneity models. He concluded that married women experience longer unemployment period than married men. Older workers face higher unemployment period as compared to younger workers. Persons with lower education were forced to have longer unemployment spell.

Pallis (2006) studied the relationship between inflation and unemployment in new European Union member states. The data used in this analysis was annual data that covered the period from 1994 to 2005, taken from European commission 2004 referred to the new ten (10) European Union (EU) member states. The three variables used are "the price deflator of GDP at market prices, nominal compensation per employee and total employment rate (%). Non-linear least square method of estimations and E-views techniques were used. This paper concludes that the application of common policies across economy may be questionable because of the different effect of these policies on inflation and unemployment.

Elameskov.et.al (1998) focused on relationship and taxation in OCED countries for the period of 1983-1994. He used Hausman specification test & concluded that impact of taxation on unemployment is positive and exogenous in short run where as in long run relationships are simultaneously determined. Main conclusion is taxation as a major determinant of unemployment in long run.

Aleksander.et.al (2009) focused on studying long run relationships among money supply, interest rate and unemployment. They concluded that these variables are positively related at low frequencies. They developed such a framework where money and unemployment were modeled by using micro details based on "search and bargaining theory". They provided a unified theory for analysis of labor and good market. As people hold a sizable amount in unemployment so the use of monetary theory can be on basis of search and bargaining or may have an alternative ad hoc plan.

Shu-Chen Chang (2006) applied VAR method of variance decomposition and impulse response function analysis for studying relationship among economic growth, trade foreign direct investment (FDI) and unemployment in Taiwan. The result showed that export and economic growth effect FDI inflow positively however export expansion has negative impact on FDI outflow. The study confirmed no relationship between FDI and unemployment where as negative relationship between unemployment and economic growth was obvious and confirmed.

Methodology
The method of analysis in this study is the Error correction Model (ECM) technique with E-VIEWS 7 as the operational software. It is one of the most commonly employed methods in estimating relationships in econometric models where major assumptions of the Ordinary Least Square (OLS) have been violated and its use in a wide range of economic relationships, has provided satisfactory results.

This study employed secondary data collected from various sources including the Central Bank of Nigeria statistical bulletin, 2015, Annual Report and Statement of Account (various issues), the National Statistical Bureau 2014; some data was complimented and sourced from web sites

which include: www.knoema.com, www.economywatch.com and www.indexmundi.com. The data series used in this study for analysis includes; Unemployment Rate (UNM), Gross Fixed Capital Formation (GFC), Exchange Rate (EXR), Interest Rate (INT), and Inflation Rate (INF).

Model Specification
Unemployment is expressed as a function of gross fixed capital formation (GFC), exchange rate (EXR), interest rate (INT), and inflation rate (INF). UNM = f (GFC, EXR, INT, INF). Specification of the model is given as follows;
$UNM = \beta_0 + \beta_1 GFC + \beta_2 EXR + \beta_3 INT + \beta_4 INF + \ldots\ldots U$
Where;
UNM = Unemployment rate
GFC = Gross Fixed Capital Formation (proxy for GDP growth rate)
EXR = Exchange rate
INT = Interest rate
INF = Inflation rate
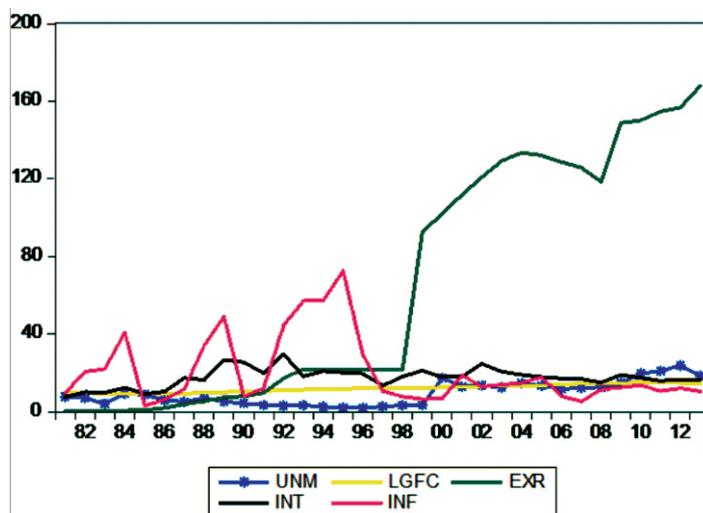U = Error term
The apriori expectations for the coefficients are as follows; $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$
All the variables are in rates except gross fixed capital formation hence the need to log gross fixed capital formation in order to scale down, smoothen the data and remove outliers.

Figure 1: Graphical Illustration of Unemployment Versus LGFC, EXR, INT. and INF.

Analysis of Results and Discussion of Findings
Table 1: OLS Result

Dependent Variable: UNM
Method: Least Squares
Date: 11/28/16   Time: 17:36
Sample: 1982 2014
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.79042	6.258608	3.481672	0.0017
LGFC	-1.417253	0.636078	-2.228111	0.0341
EXR	0.131827	0.021007	6.275450	0.0000
INT	-0.168592	0.103801	-1.624193	0.1155
INF	-0.022102	0.031111	-0.710422	0.4833

R-squared	0.858176	Mean dependent var		9.784848
Adjusted R-squared	0.837916	S.D. dependent var		6.391749
S.E. of regression	2.573298	Akaike info criterion		4.866981
Sum squared resid	185.4122	Schwarz criterion		5.093725
Log likelihood	-75.30519	Hannan-Quincriter.		4.943274
F-statistic	42.35703	Durbin-Watson stat		1.115143
Prob(F-statistic)	0.000000			

The regression equation of the model is fitted thus; UNM = 21.79042 – 1.417253LGFC + 0.131827EXR – 0.168592INT – 0.022102INF + U.

The regression equation model shows that the coefficient of logGFC is negative but statistically significant at 5 percent levels in explaining the variation in the UNM. The coefficient of EXR is also positive and statistically significant at 5 percent in explaining the variations in UNM. The coefficients of INT and INF are all negative and not significant at 5 percent. On the global statistic using adjusted R – squared (0.837916), it shows that 83.79 percent of total variation in the unemployment rate in Nigeria is accounted for by all the explanatory variables LGFC, EXR, INT and INF while 16.21 percent of the variation in UNM is linked to other variables not captured by our model. Similarly, in the overall fitness of the model the F – statistic (42.35703) shows that the model has a good fit and can be used for meaningful policy decision.

Testing for Stationarity
In order to avoid the occurrence of spurious results, this study adopted the Augmented Dickey – Fuller (ADF) test for testing the Stationary of the time series data. The ADF test statistic outcome of the time series data for the period, 1982 – 2014 shows that all-time series data (all the variables) are stationary at first difference at 5% level of significance. See table below

Table 2: Augmented Dickey-Fuller Test Statistic

	t- statistic	Critical values 1%	Critical values 5%	Critical values 10%	Prob.	Decision
UNM	-6.964788	-3.661661	-2.960411	-2.619160	0.0000	I(1)
EXR	-5.321493	-3.661661	-2.960411	-2.619160	0.0001	I(1)
LGFC	-3.562477	-3.661661	-2.960411	-2.619160	0.0127	I(1)
INT	-8.830989	-3.661661	-2.960411	-2.619160	0.0000	I(1)
INF	-5.706894	-3.661661	-2.960411	-2.619160	0.0000	I(1)

Testing for Cointegration

We seek to determine whether there exists long-run equilibrium relationship among the variables of study. In doing so, the Johansen co integration test was used. This test identifies the number of long-run relationship that exists among the sets of integrated variables. The trace statistic tests the null hypothesis that there are at most one co integrated equations. Therefore, a rejection of the null hypothesis means that there is more than one co integrating relationships.

Table 3: Johansen Cointegration Test

Date: 11/28/16   Time: 18:58
Sample (adjusted): 1983 2014
Included observations: 31 after adjustments
Trend assumption: Linear deterministic trend
Series: UNM LGFC EXR INT INF
Lags interval (in first differences): 1 to 1

Unrestricted Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.628914	76.17758	69.81889	0.0142
At most 1	0.459994	45.44664	47.85613	0.0828
At most 2	0.382591	26.34522	29.79707	0.1187
At most 3	0.299607	11.39627	15.49471	0.1883
At most 4	0.011443	0.356763	3.841466	0.5503

Trace test indicates 1 co integrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Judging from the Trace test statistic at 0.05 level that there is 1 cointegrating equation which gives credence to the fact that our model and variables are cointegrated. The implication of this is that longrun equilibrating relationship can be achieved using the model

Table 4: Error Correction Model
Dependent Variable: D(UNM)
Method: Least Squares
Date: 11/28/16   Time: 19:35
Sample (adjusted): 1986 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.201861	0.495889	-4.440231	0.0007
D(LGFC)	5.530613	1.159731	4.768874	0.0004
D(LGFC(-2))	5.934521	1.091290	5.438079	0.0001
D(LGFC(-3))	-5.720696	1.116560	-5.123501	0.0002
D(LGFC(-4))	4.606810	1.032638	4.461207	0.0006
D(EXR)	0.191806	0.014936	12.84164	0.0000
D(EXR(-1))	-0.083552	0.016545	-5.050052	0.0002
D(EXR(-2))	0.034874	0.015127	2.305320	0.0383
D(EXR(-3))	-0.070519	0.013426	-5.252286	0.0002
D(EXR(-4))	0.031776	0.015228	2.086764	0.0572
D(INT)	0.145097	0.055573	2.610906	0.0216
D(INT(-2))	-0.301610	0.060285	-5.003074	0.0002
D(INT(-3))	-0.215595	0.056560	-3.811774	0.0022
D(INF(-1))	-0.028434	0.013277	-2.141584	0.0517
ECM(-1)	0.111741	0.114261	0.977947	0.3459

R-squared	0.963263	Mean dependent var		0.442857
AdjustedR-squared	0.923701	S.D. dependent var		3.324480
S.E. of regression	0.918299	Akaike info criterion		2.971586
Sum squared resid	10.96255	Schwarz criterion		3.685267
Log likelihood	-26.60221	Hannan-Quinn criter.		3.189766
F-statistic	24.34781	Durbin-Watson stat		1.713728
Prob(F-statistic)	0.000000			

From table 4 above the model does not have speed of adjustment in the sense that the ECM coefficient is not rightly signed.

Granger Causality Test
The Granger Causality tests whether X causes Y is to see how much of the current Y can be explained by past values of X and then to see whether adding lagged values of X can improve the explanation. A variable granger causes another if the F-statistic is significant at p-value of 5 percent or less.

Table 4: Granger Causality Test

Pairwise Granger Causality Tests
Date: 11/28/16   Time: 19:53
Sample: 1982 2014
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LGFC does not Granger Cause UNM	32	6.16086	0.0191
UNM does not Granger Cause LGFC		1.74124	0.1973
EXR does not Granger Cause UNM	32	3.14358	0.0867
UNM does not Granger Cause EXR		0.07266	0.7894
INT does not Granger Cause UNM	32	0.05074	0.8234
UNM does not Granger Cause INT		0.55501	0.4623
INF does not Granger Cause UNM	32	2.20110	0.1487
UNM does not Granger Cause INF		1.69545	0.2031
EXR does not Granger Cause LGFC	32	0.09496	0.7602
LGFC does not Granger Cause EXR		3.82013	0.0603
INT does not Granger Cause LGFC	32	8.60511	0.0065
LGFC does not Granger Cause INT		0.04841	0.8274
INF does not Granger Cause LGFC	32	1.01080	0.3230
LGFC does not Granger Cause INF		1.39113	0.2478
INT does not Granger Cause EXR	32	0.11477	0.7372
EXR does not Granger Cause INT		0.13012	0.7209
INF does not Granger Cause EXR	32	1.44619	0.2389
EXR does not Granger Cause INF		1.64403	0.2099
INF does not Granger Cause INT	32	0.00197	0.9649
INT does not Granger Cause INF		0.00754	0.9314

Cursory examination of table 4 above reveals that there are unidirectional causal relationships between log of Gross Fixed Capital Formation (LGFC) and Unemployment (UNM) and Interest Rate (INT) also granger causes log of Gross Fixed Capital Formation (LGFC). The results were based on 1 lag length utilizing the F – statistic at the 0.05 level. The implication of the result is that the hypothesis of no causality is accepted for all the variables except LGFC versus UNM and INT versus LGFC.

Conclusion

Unemployment has been a consistent problem and remains difficult to manage in many countries of the world both developed and developing ones. Unemployment can be viewed from different dimensions but this paper focused on the determinants of unemployment. Our finding reveals that gross fixed capital formation has an inverse relationship with unemployment while exchange rate, interest rate and inflation rate have a positive relationship with unemployment or stimulates unemployment positively.

Recommendations

The policy makers need to improve the distribution of income in Nigeria to shift the impact of growth towards increasing the employment rate.

1. We need to have proper utilization of foreign investment to improve growth and reduce unemployment.
2. To avoid the increasing rate of unemployment situation, training opportunities need to be developed in order to develop skills of old and new workers of organizations to adopt changes of the environment.
3. Government need to create employment opportunities for both educated and uneducated people. Labor intensive strategies are needed for the poor people in rural and urban areas so that they can participate in the growth of the economy.
4. Government need to diversify the economy by providing the enabling environment for the teeming population to go into agriculture considering the number of people that can be employed in this sector.
5. Government need to provide infrastructure especially power so that the artisans and other small scale businesses can spring up and jump start our economy.
6. Investment -friendly rate of interest is necessary for promoting economic growth; infrastructural decay should be addressed as infrastructural expenditure incurred by banks are passed to borrowers through interest rate.
7. The study recommends further research to be done by including import, power generation as independent variables to have a broad view towards unemployment and the reasons of unemployment in Nigeria.

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