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To cite this article: Aronu, C.O., Arhowwon, O. & Bilesanmi A. O. & Okafor, P. N., L., (2023). The Nexus Between Unemployment Rate and Some Macroeconomic Variables in Nigeria, *Focus on Research in Contemporary Economics (FORCE)*, 4(2), 553-571.

To link to this article: <https://www.forcejournal.org/index.php/force/article/view/106/72>



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Published online: 5 April 2024



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THE NEXUS BETWEEN UNEMPLOYMENT RATE AND SOME MACROECONOMIC VARIABLES IN NIGERIA

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ABSTRACT

In a world grappling with unemployment issues, this study focused on the unemployment rate in Nigeria, examining the impact of population growth rate (PGR), population size, Gross Domestic Product per capita (GDPC), and Gross Fixed Capital Formation (GFCF). Unemployment is a widespread problem, leading to disparities in labor markets, deepening poverty, and substandard living conditions. The study aimed to determine the order of integration for these variables and assess both short-term and long-term effects on the unemployment rate. Key tools used for analysis included the Augmented Dickey-Fuller (ADF) test, the Jarque-Bera test, and the Co-integration test. The Eviews 9.0 Software was employed to analyze the data. Results showed that PGR, GDPC, and GFCF were integrated of order 1 ($I(1)$), while Population was integrated of order 0 ($I(0)$). Over the study period, all series exhibited trends but remained stationary. The co-integration ARDL bound test revealed a long-term link between the variables. Based on the error correction coefficient, the system's prior period disequilibrium should be corrected at a rate of 12.1% every year. The long-term effects of both gross fixed capital formation (GFCF) and gross domestic product per capita (GDPC) on the unemployment rate were shown to be substantial. The study suggests making significant investments in small and medium-sized businesses in order to increase GDPC and GFCF, which will have a favourable long- and short-term impact on unemployment rates.

KEY WORDS:

Co-integration, Economy, Investments, Population Growth Rate, Estimator, Unemployment

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1. INTRODUCTION

Nigeria is the most populous country in Africa and the ninth most populous worldwide, home to around 200 million people. Although the nation's economy is mostly dependent on the oil sector, which makes substantial contributions to export profits and government income, a persistent problem while unemployment casts a shadow over this promising environment (Reed and Mberu, 2014). Indeed, one of the biggest obstacles to Nigeria's social and economic development is unemployment. In addition to being a significant underutilization of the country's human potential, it causes a significant loss in welfare because of decreased output, which lowers income and has a negative effect on living standards generally. Nigeria is thus faced with the grim reality of ongoing unemployment, a problem that has its roots in a past tainted by corruption, military control, incompetence, and civil unrest.

Nigeria has a wealth of natural and human resources, but they haven't been used to their full potential to generate profits. As a result, there is a chronic and growing unemployment problem, which is made worse by population increase and the steady stream of recent college graduates vying for few available jobs (Aliyu and Amadu, 2017). The national unemployment rate has fluctuated over the years due to a variety of economic variables and policy choices (Egunjobi, 2014). Due to the economic unrest that occurred throughout the 1970s, there was a rise from 4.3% in 1970 to 6.4% in 1980 (National Bureau of Statistics (NBS), 2018). The late 1970s recession forced the implementation of stabilization policies, such export controls, which ironically increased the reliance of many industrial companies on imports, resulting in decreased operating capacity and, occasionally, plant closures. Increased unemployment was a result of these economic difficulties.

The Nigerian government also imposed job embargoes in the early 1980s, which made the country's unemployment problem worse. Thus, in addition to other economic reform initiatives like the National Economic Empowerment and Development Strategy (NEEDS) and the seven-point agenda, the government launched the Structural Adjustment Program (SAP) in 1986 (Odusola and Obadan, 2018). The goal of all of these initiatives was to increase the creation of jobs. Nonetheless, there has been disagreement on these measures' effectiveness (Ogujiuba and Mngometulu, 2022). The data presents a dismal

image, demonstrating that not only did unemployment rise sharply when different policies and initiatives were put into place, but it has also continued and become worse due to factors like population growth and an ongoing flood of recent graduates looking for work. The national unemployment rate increased throughout time, reaching a record of 21.2% in 2010 from 4.3% in 1970 (Yusuf and Mohd, 2023). Before the global economic crisis struck, Nigeria's industrial industry struggled and several of its factories shuttered. Moreover, a time of worldwide economic slump accompanied Nigeria's political transition. While globalization benefited highly developed countries, it presented rising nations like Nigeria with economic and sociopolitical issues (Akintoye, 2008). Obstacles included concerns about poverty, health, and equitable employment for women.

The aim of this study was to investigate the complex relationships that exist between several macroeconomic factors and Nigeria's unemployment rate. This study seeks to provide light on this complicated problem and insights into possible solutions by analyzing the effects of variables including population growth rate (PGR), population size, Gross Domestic Product per capita (GDPC), and Gross Fixed Capital Formation (GFCF) on unemployment. Comprehending the fundamental principles of unemployment is important in order to devise efficacious measures to tackle this pressing issue, promote social and fiscal advancement for Nigeria. The purpose of this study is to look at the connections between macroeconomic factors and Nigeria's unemployment rate between 1970 and 2021. To achieve this aim, the study seeks to accomplish the following specific objectives includes to: Determine the order of integration of the variables considered in the study; Ascertain the short-run and long-run effects of selected macroeconomic variables on the unemployment rate in Nigeria; and Identify the macroeconomic variable(s) that most significantly impact the unemployment rate in Nigeria.

2. LITERATURE REVIEW

Researchers have looked into the complex web of relationships between unemployment and numerous economic issues in Nigeria as well as other nations since it is a complicated problem with broad-reaching effects. These studies clarify the complexity of unemployment and offer insightful information to policymakers.

The International Labor Organization (ILO) agrees that unemployment is a worldwide problem. The ILO (2016) defines unemployment as include those who

are economically active, jobless, and actively looking for work. This definition encompasses all inhabitants of Nigeria aged 15 to 64 who are not housewives, students, retirees, or otherwise unemployed. It's an essential indicator for comprehending the labor dynamics of a country. Nigeria has a horrifying unemployment problem in 2018. According to data from the National Bureau of Statistics (NBS), there were 20.9 million officially jobless people in Q3 2018 compared to 17.6 million in Q4 2017. The unemployment rate increased dramatically as a result of this worrying rise, jumping from 18.8% in Q3 2017 to 23.1% in Q3 2018 (NBS, 2018). This startling data suggests that more than 50% of Nigeria's population might be unemployed, a crisis with significant socio-economic implications.

There is no one definition of unemployment. Different types of unemployment are recognized by economists, and each has its own problems. These include cyclical, frictional, and structural unemployment, which are all frequently entangled and difficult to separate. As a result, economists struggle to determine the scope of each kind and how it affects the labor market. An important economic link is the relationship between unemployment and Gross Domestic Product (GDP). An economy's strength, which is sometimes gauged by its GDP, depends on how productive its labor is. According to Okun's Law, each extra percentage point of unemployment can cost an economy up to 2% of its GDP, highlighting the inverse relationship between unemployment and GDP. The cost of lost output increases significantly (Okun, 1962).

Typical neo-classical theories of economic growth, such the Solow model, provide an alternative perspective (Cinnirella and Streb, 2017). They stress that rather than only capital accumulation, sustainable economic growth depends on variables including higher worker productivity, workforce size, and technology improvements (Gabardo et al., 2017). This calls into question the idea that growth can always be driven by a simple influx of cash. Nigeria's unemployment has a variety of root reasons. Reemployment is made more difficult by the fragmented labor market, which is marked by a lack of mobility between job categories. The problem is made worse by the labor force's quick expansion, which is caused by population growth and migration trends. Jobs prospects have also been impacted by changes in the economic environment, such as a shift away from agriculture and toward other industries. Nigeria's continually poor economic climate makes it difficult to create jobs. This discourages investment attempts along with security worries. Even individuals who want to create their own businesses run into obstacles because of inadequate infrastructure and a

difficult investment environment. Additionally, demographic changes are crucial. Job development initiatives may be hampered by the flood of new workers, especially following a baby boom. Unemployment grows when not enough jobs are created to handle this influx.

Numerous studies in Nigeria have investigated the connections between numerous important economic factors and unemployment. Aimola et al. (2021) further emphasized the relationship between inflation and unemployment in another study. They found a strong positive association between the two variables using long-term time series data, suggesting that inflationary pressures may make Nigerian unemployment worse. The study conducted by Oumarou and Maigaa (2019) explores the complex link between trade, foreign direct investment (FDI), and economic development in an exploratory look at Niger's economic environment. The research reveals intriguing insights by using a variety of econometric tests, such as the Granger causality test, Kwiatkowski-Philips-Schmidt-Shin stationary test, Johansen co-integration test, and Augmented Dickey–Fuller unit root test. The results present a dynamic image. It turns out that commerce and economic expansion are mutually supportive of one another. But there is more of a one-way relationship between trade and FDI, with trade having a major impact on FDI. The impact on economic growth, however, is a finding that may surprise some: trade promotes it, while FDI, shockingly, has a dampening effect in Niger. The study provides insightful information about the subtleties of Niger's economic environment. It presents a patchwork of complex linkages, emphasizing how trade and foreign direct investment have shaped the country's economic history.

According to the study by Akeju and Olanipekun (2015), unemployment has increased over the past ten years in sub-Saharan Africa, with Nigeria facing particular difficulties due to its fast population expansion and low employment rates. Their research explores Okun's Law and evaluates its suitability for Nigeria. It reveals the links between unemployment and economic growth over the short and long terms by applying the Error Correction Model and the Johansen cointegration test. The findings highlight the urgent need for more foreign direct investment and budgetary measures to address Nigeria's skyrocketing unemployment rates. According to a related study by Elorhor (2019), unemployment is a problem for the global economy that prevents growth. Because of this, his research examined the effect of unemployment on economic development in Nigeria between 1986 and 2008. The results, which

make use of a number of statistical tests and procedures, show how important it is for Nigeria's economic growth to have employed labor, capital formation, unemployment, and job openings all at the same time. Interestingly, the Gross Domestic Product decreases by around 11.56 percent for every 1% increase in unemployment. The results highlight the necessity of increasing capital formation, infrastructure development, and government action to support economic growth and employment creation. More investigation is necessary to provide complete answers.

According to Obidike and Nduka (2022), a number of economic obstacles have surfaced as a result of Nigeria's interaction with market forces since the Structural Adjustment Programme was implemented in 1986. These include high interest rates, trade imbalances, erratic currency rates, growing unemployment, and unpredictable economic growth. This 34-year research, which runs from 1987 through 2020, examines how macroeconomic factors affect the Nigerian economy. The results show that the money supply, trade openness, foreign direct investment, and inflation all have a positive short-term impact on the real gross domestic product. Exchange rates and interest rates, however, have little influence. Policymakers should use expansionary monetary policies to spur economic development, improve productivity to reduce inflation, and maintain currency stability to support the Nigerian economy.

Sahoo and Sahoo (2019) examined the relationship between a number of macroeconomic factors and unemployment in India by looking at the country's unemployment dynamics. Their investigation uncovered intricate connections. They concluded that there was an inverse relationship between unemployment and economic growth, with economic expansion causing a decrease in the jobless rate. Sahoo and Sahoo (2019) suggested that the Indian government give the development of new job opportunities top priority in light of their results. Regardless of the education and occupation of the populace, they suggested upgrading the agriculture sector and enhancing agricultural infrastructures as a way to increase the industry's appeal and create jobs. Dayıoğlu and Aydın (2021) examined the theoretical connections between Turkey's current account balance, inflation, unemployment, and economic development from a theoretical perspective. They discovered a negative correlation between growth and unemployment, particularly in times of crisis, underscoring the significance of economic stability in controlling unemployment.

In Summary, it should be noted that unemployment in Nigeria is a complex issue with a variety of core reasons, such as population increase, altering economic dynamics, and adverse governmental initiatives. Holistic methods that take into account not just economic policies but also changes to the investment climate, education, and skill development are needed to address this issue. The fight against unemployment is still a crucial effort for Nigeria as it works to realize its enormous potential. All things considered, these studies show that unemployment is a complex problem affected by a range of economic variables, such as inflation, foreign direct investment, and economic expansion. Comprehending these intricate processes is imperative in formulating efficacious programs to counter unemployment and advance economic prosperity in these nations.

3. MATERIAL AND METHODOLOGY

3.1. Source Of Data

In this research, secondary data has been used. Secondary data is collected from the Central bank Statistical Bulletin 2021, World Bank National Accounts Data and International Labour Organization, ILOSTAT database. There are five variables which include: Unemployment Rate (UNER), Population Growth Rate (PGR), Population Size (Population), Gross Domestic Product per capita (GDPC) and Gross Fixed Capital Formation (GFCF).

3.2. Method of Data Analysis

In the realm of macroeconomics, understanding the stationary nature of time series data is paramount. The term "stationary" refers to a crucial property of time series datasets where the mean and variance of the data remain constant over the observed time period. It implies that the distribution of data remains stable over time. Furthermore, in stationary data, the covariance between two time periods is solely determined by the time interval between those periods, regardless of the actual time when this covariance is calculated. Conversely, if these conditions are not met, the process is considered non-stationary.

Various statistical tests are available to assess the stationarity of time series data. The Augmented Dickey-Fuller (ADF) test, Phillips-Perron test, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, and the Phillips-Perron tests all serve as tools in this evaluation (Afriyie et al., 2020). For this study, we have opted to utilize the ADF test to determine the stationarity status of the data collected. The ADF test is a robust method for identifying the presence of a unit

root in a time series dataset, with the test statistic yielding a negative value (Ramenah et al., 2018). The hypothesis under scrutiny involves determining if the data has a unit root (indicating non-stationarity) or if it is stationary without this root. If the test statistic is more negative, it provides stronger evidence against the presence of a unit root, thereby favoring stationarity (Rahman et al., 2023).

The next step involves choosing the order of integration, denoted as 'p.' The null hypothesis, 'H0,' asserts the presence of a unit root (non-stationarity), while the alternative hypothesis, 'H1,' states that no unit root exists (stationarity). The selection of 'p' is based on how many times differencing is necessary to reject 'H0,' signifying the number of unit roots present. Once 'p' is established, the specific ARDL models are employed, tailored to the dataset at hand. The ARDL (m, n; p) model captures the essence of the relationship between variables, accounting for exogenous variables and lag structures. The model's final form ensures the errors within it maintain white noise characteristics.

In the world of time series analysis, the cointegration test plays a crucial role. Cointegration delves into the exploration of stationary linear combinations of integrated variables, unveiling shared stochastic trends and long-run equilibrium (Engle and Granger, 1987). For cases where variables exhibit different integration orders, the ARDL approach shines as the most suitable technique. To navigate this complex web of statistical methods, the present study endeavors to determine the order of integration, discern the short-run and long-run impacts of selected macroeconomic variables, and ultimately identify which variables wield the most significant influence on the unemployment rate in Nigeria. The goal is to unlock a deeper understanding of this multifaceted issue, supporting the creation of more effective policies that drive social and economic development in Nigeria.

The data obtained for this study was analyzed with the aid of Eviews 9.0 Software.

4. RESULTS

This section presents the data analysis using the data obtained for the study which available on request.

4.1. Data Analysis

The result obtained in table 1 below shows the descriptive properties of the data obtained for the present study.

Table Table 1. Descriptive Statistics of Unemployment Rate (UNER), Population Growth Rate (PGR), Population Size (Population), Gross Domestic Product per capita (GDPC), and Gross Fixed Capital Formation (GFCF).

Measures	LOG(UNER)	LOG(PGR)	LOG(POPULATION)	LOG(GDPC)	LOG(GFCF)
Mean	2.285248	2.534217	4.524079	9.672227	13.15335
Median	2.185483	2.660740	4.656531	9.959603	12.04456
Std. Dev.	0.587723	0.665827	0.708200	2.914462	4.034293
Skewness	0.270505	-0.862801	-1.550854	0.204628	0.867472
Kurtosis	2.039644	2.897383	5.258882	1.545083	2.268502
Jarque-Bera	2.632448	3.685058	1.242356	4.949261	7.681099
Probability	0.268146	0.158416	0.537311	0.084194	0.061482
Observations	52	52	52	52	52

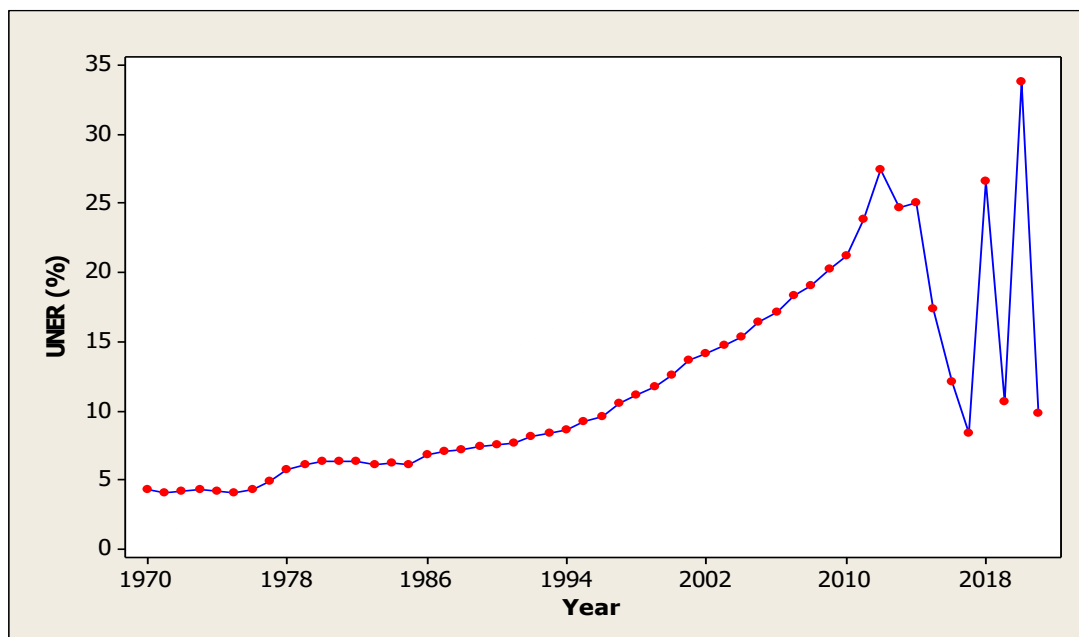
Source: Author's Analysis

The The result of the descriptive statistics presented in Table 1 found that the mean unemployment rate (UNER) over the period of the study was 2.29%, population growth rate (PGR) was 2.53%, population size was 4.52 billion, Gross Domestic Product per capita (GDPC) was N9.67 million while the Gross Fixed Capital Formation (GFCF) was N13.15 million. The standard deviation for the variables showed that the values in the data set were approximately close to their various means. All the variables positively skewed as indicated by the positive Skewness coefficients except for the population growth rate and the population size which were found to be negatively skewed with a coefficients of -0.862801 and -1.550854 respectively. The result of the Jarque-Bera test showed that the variables were approximately normally distributed after taking logarithm of the variables with p-values obtained as 0.268146, 0.158416, 0.537311, 0.084194, and 0.061482 for LOG(UNER), LOG(PGR), LOG(POPULATION), LOG(GDPC) and LOG(GFCF) respectively .

The result presented in Figure 1 revealed that from 1970 to 1989, the average UNER remains relatively stable, ranging from 4.1 to 7.4, with minor fluctuations. It should be noted that the average UNER represents the average underemployment rate for each corresponding year. It was found that starting from the 1990s, there was an increase in the average UNER, indicating a rise in underemployment rates. This upward trend continues until the early 2000s. The average UNER reaches its peak in 2008 at 19.1, suggesting a higher level of

underemployment during that period. After 2008, there was a gradual decline in the average UNER, with some fluctuations in subsequent years. The outcome shown in Figure 1 indicated that, from 1970 to 1989, the average UNER remained mostly steady, fluctuating very little between 4.1 and 7.4. The average UNER, it should be noted, indicates the average rate of underemployment for each corresponding year. Indicating a rise in underemployment rates, it was discovered that the average UNER increased beginning in the 1990s. The early 2000s saw the continuation of this increasing trend. The average UNER peaks in 2008 at 19.1, indicating increased underemployment rates during that time. The average UNER began to gradually fall after 2008, with occasional volatility in the years that followed. The average UNER increased significantly in 2020, rising to 33.8, but it decreased noticeably in 2021 compared to 2020 but remained very high at 9.79. The average UNER trend indicates that underemployment rates have fluctuated throughout time, with some eras seeing higher underemployment rates than others.

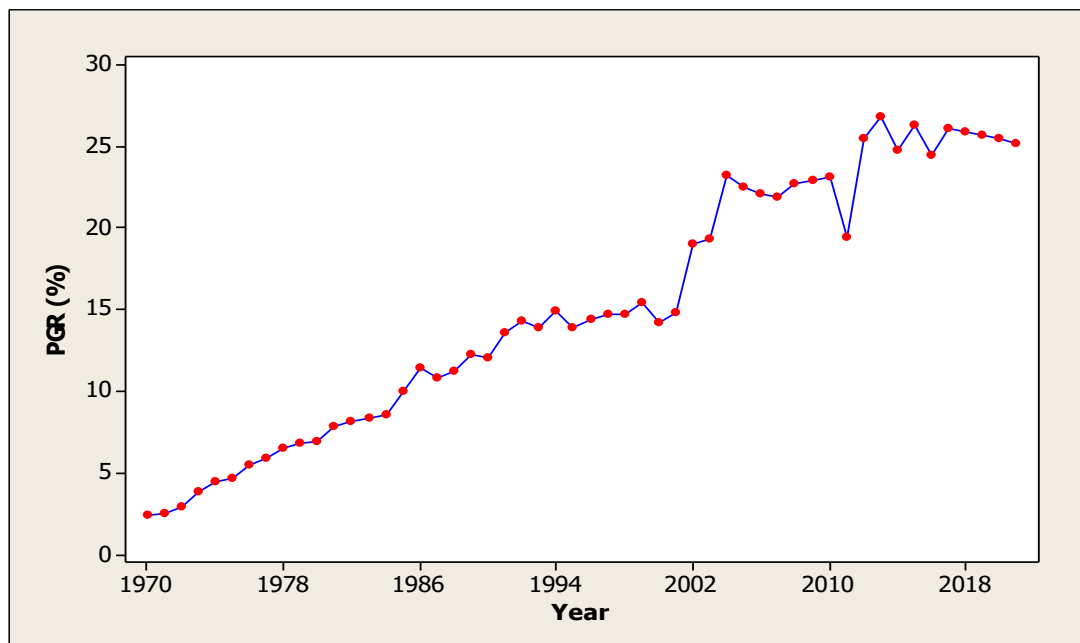
Figure 1. Time Series Graph of Unemployment Rate (%) from 1970 -2021



According to the data shown in Figure 2, average PGR between 1970 and 2021 fluctuates between various years, showing changes in population increase. Throughout the 1970s and 1980s, the average PGR remains comparatively steady between 2.4 and 6.8. The average PGR starts to vary more after the 1990s, with some years showing greater growth rates (such as 1999, with a PGR of 15.432) and others showing lower growth rates (such as 2011, with a

PGR of 19.4). The average PGR increased significantly between 2001 and 2004, peaking at 23.173 in that year. With minor shifts in the most recent years (2020 and 2021), the average PGR incrementally drops and stabilizes around 25. In accordance with the average PGR trend, there are periods of relatively steady population growth interspersed with periods where growth rates are higher or lower.

Figure 2. Time Series Graph of population growth rate (%) from 1970 - 2021



4. 2. Testing the variables for Stationarity

A stationary process is a process or series whose properties do not depend on the time at which the series is observed. For this purpose, the Augmented Dickey-Fuller (ADF) test was used to test the stationarity of the data.

H01: (Non Stationarity)

vs

H11: (Stationarity)

The result of the unit root test on the variables using the Augmented Dickey-Fuller test statistic obtained in Table 2 found that the UNER, PGR, GDPC and GFCF has no unit root and stationary overtime at the first difference with trend since the test statistic value has more negative values (-5.864978, -8.425551, -6.201611, and -7.092285 respectively) at 5% significant level while the Population was found to have no unit root and stationary overtime at the zero

difference with trend since the test statistic value has more negative value (-4.744635) at 5% significant level.

This result implies that UNER, PGR, GDPC and GFCF are integrated of order 1 ($I(1)$) while Population was integrated of order 0 ($I(0)$). Hence, all the series were stationary over the study period with the presence of trend.

Table 2. Result of Augmented Dickey-Fuller unit root test for the variables

Variables	Level		1 st Difference		Order of integration
	No Trend	With Trend	No Trend	With Trend	
LOG(UNER)	-1.040046	-1.568633	-5.900122	-5.864978	$I(1)$
LOG(PGR)	-3.511782	-2.387340	-7.055992	-8.425551	$I(1)$
LOG(POPULATION)	-5.465517	-4.744635	-	-	$I(0)$
LOG(GDPC)	0.035282	-2.287959	-6.253944	-6.201611	$I(1)$
LOG(GFCF)	0.517817	-1.821191	-6.897727	-7.092285	$I(1)$
Critical values					
5%	-2.926622	-3.51307	-2.926622	-3.510740	

Source: Author's Analysis

4. 3. Result of the Co-integration test of the Variables

The result presented in Table 2 showed that some of the variables were found to be stationary at zero difference $I(0)$ but after first differencing $I(1)$, they all became stationary. The differencing was applied to avoid having a spurious regression. Since the differenced variables were stationary, there could be co-integration between the variables. This test enables one to know if some of the variables in the model are cointegrated and as well shows if there is long term relationship existing between the set of the variables. When the variables are integrated of different order as the situation in the present study, the appropriate method to employ is the autoregressive distributed lag (ARDL) approach. Hence, the present study shall employ the ARDL approach to examine the long-run relationship of the variables since the variables were integrated of order ($I(1)$ and $I(0)$). The number of the lag used in the co-integration test is based on the information criterion used in the underlying model. The co-integration trace test of UNER, PGR, GDPC, GFCF and Population was presented in Table 3.

The ARDL Model for the model is presented by performing the ARDL bound test to determine whether the level relationship is present amongst the variables considered in the ARDL model. The result presented in Table 3 shows the estimates of the ADRL model describing the relationship that exists between the UNER, PGR, GDPC, GFCF and Population. The result of the ARDL bound test for co-integration presented in table 3 found a calculated F -statistic value of 9.940358 which was above the upper bounds critical value of 4.01 assuming a 5% significance level. This result indicates the rejection of the null hypothesis of no cointegrating relationship amongst the variables of the ARDL model. Hence, the findings imply that Unemployment Rate (UNER) is cointegrated with Population Growth Rate (PGR), Population Size (Population), Gross Domestic Product per capita (GDPC) and Gross Fixed Capital Formation (GFCF). Also, the result further implies that there exists a long-run relationship amongst the variables.

Table 3. Result of test for the existence of level relationship amongst the variables in the ARDL

Number of regressors	Value of statistic $K=4$
Computed F-statistic	9.940358
5% critical value	
Lower bound value	2.86
Upper bound value	4.01

The critical bound values were extracted from (Pesaran et al., 2001).

The result obtained in Table 3 revealed that there exist a long-run relationship amongst the variables of the ARDL model since the computed F-statistic value of 9.940358 was greater than the lower and Upper bound values at significant level of 0.05 ($9.940358 > (4.01, 2.86)$). Hence it is appropriate to obtain the estimates of the ARDL long-run coefficient for the model and also obtain the estimates of the error correction model (ECM). The result of the long-run estimates is presented in Table 4 while the result obtained in Table 5 presents the estimates of the corresponding ECM. After evaluating 16 models, the ARDL (1, 0, 0, 0, 0) model was selected as the better model using the Hannan-Quinn criterion (HQ). The result indicates that UNER has 1 lag, PGR has 0 lag, Population has 0 lag, GDPC has 0 lag, and GFCF has 0 lag in the model; this can be seen in the result presented in Table 5..

Table 4. Estimated long-run coefficients: ARDL(1, 0, 0, 0, 0) selected by Hannan-Quinn criterion (HQ).

Variable	Coefficient	Std. Error	t-Statistic	Pro b.
LOG(PGR)	0.076228	0.298715	0.255187	0.7997
LOG(POPULATION)	0.088736	0.207387	0.427876	0.6708
LOG(GDPC)	0.251094	0.065007	3.862577	0.0004
LOG(GFCF)	-0.077329	0.032277	-2.395761	0.0208
C	0.276044	0.415113	0.664985	0.5095

Source: Author's Analysis

The result of the long-run relationship between the UNER and variables such as GDPC and GFCF presented in Table 4 found that the coefficients for all the variables were significant since their p-values were obtained as 0.0004 and -0.0208 respectively and less than significant level of 0.05. It was found that PGR, Population, and GDPC have positive coefficients while GFCF has a negative coefficient. The result obtained indicates that GDPC and GFCF have significant long-run effect on group output in Nigeria.

From the result presented in Table 4, the Co-integration equation can be expressed as equation (4) below:

$$\text{Cointeq} = \text{LOG(UNER)} - (0.0762 \cdot \text{LOG(PGR)} + 0.0887 \cdot \text{LOG(POPULATION)} + 0.2511 \cdot \text{LOG(GDPC)} - 0.0773 \cdot \text{LOG(GFCF)} + 0.2760) \quad (4)$$

The presented in Table 5 showed that the error correction coefficient of -1.120594 (p -value = 0.0000) was significant and indicates that the system corrects its previous period disequilibrium at a speed of 12.1% annually. The result of the ECT (Error Correction Term) implies an oscillatory convergence since the ECT coefficient falls between 0 and -2; this ensures that the system will be convergent. A further result showed that the lag of PGR and Population Size has an insignificant short-term effect on unemployment Rate within the observed period.

**Table 5. Error correction representation of the selected ARDL model:
ARDL ARDL(1, 0, 0, 0, 0) selected by Hannan-Quinn criterion (HQ).**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(PGR)	0.085421	0.335340	0.254729	0.8001
DLOG(POPULATION)	0.099437	0.232371	0.427924	0.6707
DLOG(GDPC)	0.281375	0.080261	3.505749	0.0010
DLOG(GFCF)	-0.086654	0.036546	-2.371111	0.0221
CointEq(-1)	-1.120594	0.160302	-6.990506	0.0000

Source: Author's Analysis

5. CONCLUSION

This study examined the impact of variables such as population growth rate (PGR), population size, Gross Domestic Product per capita (GDPC) and Gross Fixed Capital Formation (GFCF) on unemployment rate (UNER) in Nigeria. The findings of the study found that the mean unemployment rate (UNER) over the period of the study was 2.29%, population growth rate (PGR) was 2.53%, population size was 4.52 million, Gross Domestic Product per capita (GDPC) was N9.67 million while the Gross Fixed Capital Formation (GFCF) was N13.15 million. The standard deviation for the variables showed that the values in the data set were approximately close to their various means. Variables such as unemployment rate (UNER), Gross Domestic Product per capita (GDPC), and Gross Fixed Capital Formation (GFCF) were found to be positively skewed as indicated by their corresponding positive Skewness coefficients while population growth rate and the population size were found to be negatively skewed with a coefficients of -0.862801 and -1.550854 respectively. The result of the Jarque-Bera test showed that the variables were approximately normally distributed after taking logarithm of the variables.

The result of the unit root test on the variables using the Augmented Dickey-Fuller test statistic found that the UNER, PGR, GDPC and GFCF has no unit root and stationary overtime at the first difference with trend while the Population was found to have no unit root and stationary overtime at the zero difference with trend. This result implies that UNER, PGR, GDPC and GFCF are integrated of order 1 (I(1)) while Population was integrated of order 0 (I(0)). Hence, all the series were stationary over the study period with the presence of trend.

The result of the ARDL bound test for co-integration hat Unemployment Rate (UNER) is cointegrated with Population Growth Rate (PGR), Population Size (Population), Gross Domestic Product per capita (GDPC) and Gross Fixed

Capital Formation (GFCF). Also, the result further implies that there exists a long-run relationship amongst the variables. Hence it is appropriate to obtain the estimates of the ARDL long-run coefficient for the model and also obtain the estimates of the error correction model (ECM). After evaluating 16 models, the ARDL (1, 0, 0, 0, 0) model was selected as the better model using the Hannan-Quinn criterion (HQ). The result indicates that UNER has 1 lag, PGR has 0 lag, Population has 0 lag, GDPC has 0 lag, and GFCF has 0 lag in the model.

The error correction coefficient was found to be -1.120594 (p -value = 0.0000) which indicates that the system corrects its previous period disequilibrium at a speed of 12.1% annually. The result of the ECT (Error Correction Term) implies an oscillatory convergence since the ECT coefficient falls between 0 and -2; this ensures that the system will be convergent. A further result showed that the lag of PGR and Population Size has an insignificant short-term effect on unemployment Rate within the observed period. The outcome of the present study revealed that Gross Domestic Product per capita (GDPC) and Gross Fixed Capital Formation (GFCF) has significant long-run impact on unemployment rate, hence, we recommend huge investment in small and medium scale industries in other to boost the GDPC and GFCF to have the expected positive impact on unemployment rate both on the short-run and long-run. Also, the study recommends an evidence-based diversification of the Nigerian economy which is expected to grow sectors such as the agricultural sector as a medium of reducing unemployment in Nigeria and minimize the rush for limited white-collar jobs in the country.

DISCLOSURE OF CONFLICT

The authors declare that they have no conflicts of interest.

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