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AN IN-DEPTH ANALYSIS ON THE EMERGENCE OF BRAIN DRAIN AND POVERTY: A RESULTANT EFFECT OF ECONOMIC INSTABILITIES IN NIGERIA

ADESUYI, OLUWABUKOLA OMOBOLA (PhD)
Department of Economics, Babcock University, Ilishan-Remo, Ogun State, Nigeria
adesuyiolu@babcock.edu.ng

JULIET O. ONONGHA
Department of Economics, Babcock University, Ilishan-Remo, Ogun State, Nigeria
julietsnr@yahoo.co.uk

&

AMODU NIEMAT OLASUBOMI
Department of Economics, Babcock University, Ilishan-Remo, Ogun State, Nigeria
amodu7536@student.babcock.edu.ng

Abstract

Purpose *- This study examined the effect of economic instabilities on poverty and brain drain in Nigeria between 1990 to 2023.*

Design/methodology/approach *- The study employed a time series econometric approach using ADF and Phillips-Perron tests for stationarity and the ARDL bounds testing technique to examine the long-run relationships. The ARDL model is used for estimation, while diagnostic tests ensure model validity.*

Findings *- The results showed that economic instability variables have both positive and negative effects on poverty and brain drain, depending on the specific variable and model. Inflation, however, consistently exhibits a positive relationship in both models. All variables were found to be statistically significant. The diagnostic tests confirm that the models are robust, with no evidence of serial correlation, multicollinearity or heteroskedasticity, and that the models are correctly specified.*

Originality/value *– The study contributes by jointly analysing the impact of economic instability on poverty and brain drain using ARDL, providing policy-relevant insights into their interconnected effects.*

Keywords *- Economic Instabilities, Brain Drain, Poverty, Inflation, Interest Rate, Unemployment Rate, GDP Growth Rate, Net Migration.*

Introduction

Economic instability has remained a persistent challenge in Nigeria, affecting major economic indicators such as inflation, unemployment, interest rates, and GDP growth. Over the years, the country has experienced rising inflationary pressures, exchange rate depreciation, and increasing living costs, all of which have weakened economic performance and reduced citizens' welfare. According to the National Bureau of Statistics (2023), Nigeria recorded one of its highest inflation rates in 1996, while recent increases in food prices, transportation costs, and fuel subsidy removal have continued to worsen inflation and the cost of living (Akinboyo, 2024). The economic fluctuations in the country have further confirmed the need for effective economic management, as government interventions have not sufficiently addressed the persistent economic crisis characterised by high inflation and interest rates (Godwin, 2014).

Poverty in Nigeria is multidimensional, involving inadequate access to opportunities, healthcare, education, and social amenities.

According to the World Bank (2001), poverty reflects inadequate opportunities, low empowerment, and inefficient security systems, while the United Nations (1998) describes poverty as a denial of choices, opportunities, and human dignity. Poor healthcare services, low life expectancy, and high infant mortality rates remain common consequences of poverty in Nigeria (Lawanson & Umar, 2021). These conditions have made many households vulnerable to hardship, diseases, and social exclusion (Chimobi, 2010).

Furthermore, persistent economic instability has contributed significantly to the increasing rate of brain drain in Nigeria. According to Dulam (2015), the migration of skilled professionals from developing to developed countries has generated global policy concerns, while Siekierski et al. (2018) noted that the phenomenon has intensified in recent years. UNESCO (2007) reported that thousands of African professionals, including doctors, engineers, and university lecturers, migrate abroad annually in search of better opportunities. Similarly, Peter and Ekeopara (2012) argued that Nigeria's unstable economy has encouraged individuals to seek employment and improved living conditions abroad, leading to a significant loss of human capital. The departure of these skilled professionals weakens critical sectors such as healthcare, education, and engineering, thereby slowing national development (Ike, 2007).

Several studies have examined economic instability, poverty, and migration independently; however, limited attention has been given to the combined effect of economic instability on both poverty and brain drain in Nigeria. Therefore, this study examines the impact of economic instability on poverty and brain drain in Nigeria between 1990 and 2023, using variables such as inflation rate, unemployment rate, interest rate, GDP growth, poverty rate, and net migration.

Literature review

Conceptual review

Economic Instability - Economic Instability can be defined as a state of fluctuations in an economy characterised by changes in key economic indicators that are often unforeseen. Economic instability, which is reflected in fluctuations in economic variables such as inflation, unemployment, GDP growth, oil prices and interest rates, can significantly affect the overall functioning of an economy. Since Nigeria relies mainly on oil exports, it is particularly vulnerable to economic instability. Fluctuations in variables such as inflation, unemployment and interest rates are major contributors to economic instability in Nigeria. To address these challenges and achieve a balance in regulating and managing these variables, Nigeria needs to implement effective macroeconomic policies, diversify its economy and revenue streams, improve infrastructure, and implement strict measures to tackle corruption.

Poverty - It can be challenging to define poverty since it has a detrimental effect on a number of facets of the human experience, such as one's moral, psychological, and physical well-being. Sen (1981) states that analysts typically use income levels that are insufficient to purchase necessities to define poverty. This point of view emphasises people's potential to live and support themselves, as well as their ability to obtain the resources required to do so. Finding a definition that is widely recognised is made more difficult by the complexity of poverty, which necessitates a thorough grasp of both economic and social elements. (Rakodi & Amis, 1994). Other experts, like Ojha (1970) and Reutlin-ger & Selowsky (1976), have defined the poor as the segment of the population that cannot afford basic necessities. Others believe that health and/or education factors, such as life expectancy, child mortality, etc., contribute to poverty. Others, such as Musgrove and Ferber (1976), use

consumption and expenditure levels as a criterion to determine who is impoverished. Taking into consideration how such commodities are obtained (e.g., money, coupons, etc.) and the availability of the needed products, poverty can also be linked to "entitlements" (Sen, 1983), which are defined as the numerous bundles of goods and services over which one has command. Yet, other experts see poverty in very broad terms, such as being unable to meet "basic needs" - physical (food, health care, education, shelter, etc) and nonphysical (participation, identity, etc) requirements of a "meaningful life". (Blackwood & Lynch, 1994).

Unemployment - Unemployment stands out as a significant developmental challenge currently confronting Nigeria. Research indicates that while unemployment rates were elevated in the 1980s, recent reports from various local and international organisations, along with the visible signs of joblessness today, reveal that the current situation is unprecedented in Nigeria's history. It's important to recognise that, at different times, the government has made efforts to address unemployment, even if those efforts have not yet yielded the desired results. (Asaju *et al.*, 2014).

Unemployment, according to the ILO, is considered to be the biggest threat to social stability in many countries (including Nigeria), putting the global rate at 12.6% (ILO, 2012). Current statistics accumulated by the World Bank have put the unemployment rate in Nigeria at 22 percent, while the youth unemployment rate is 38 percent. The report has revealed that 1535 years olds account for close to 60 percent of Nigeria's population and 30 percent of the workforce. The report also indicates that approximately 4 million people enter the labour market every year (Subair, 2013).

Inflation - Inflation can have both positive and negative effects on an economy, depending on its rate. According to Abdul Syed and Qazi (2007), a moderate inflation rate of about 3 - 6% may encourage investment, production, wage growth, and consumption, thereby promoting economic growth. However, a high inflation rate, especially at double-digit levels, produces adverse economic effects by reducing consumers' purchasing power and creating uncertainty for borrowers, lenders, buyers, and sellers.

Similarly, Andow et al. (2015) noted that high inflation discourages savings and investment because it lowers the real returns on financial assets, leading to low investment and declining economic growth. High inflation also worsens poverty levels, increases class conflict, raises food prices, and reduces the standard of living. Inflation is commonly measured as the percentage change in the Consumer Price Index (CPI) on a year-on-year basis, reflecting changes in the prices of goods and services over time.

According to the National Bureau of Statistics (2023), Nigeria's annual inflation rate rose to an over 18-year high of 26.7% in September 2023 from 25.8% in August, largely due to the removal of fuel subsidy and the depreciation of the Naira. As inflation rises, the purchasing power and value of the country's currency decline over time.

Theoretical Review

New Growth Theory in economics presents a situation in which the pursuit of profit, individual needs, and human desires drive economic progress. The theory was developed by Paul Romer. According to the new growth idea, when people's needs and wants rise, they are more inclined to take risks, be creative, and better themselves (Solow, 1994). This turns into the engine of economic expansion. The theory asserts the value of education, learning, knowledge, and human capital. Therefore, the theory recommends giving human capital precedence over physical capital (land, infrastructure) when it comes to implementation. Paul Romer's new

growth theory, sometimes referred to as endogenous growth theory, places a strong emphasis on how information, creativity, and ideas propel long-term economic expansion.

Push-pull Migration Theory - An English geographer named Ravenstein in 1889 developed a 'Law of Migration'. He concluded that the migration process was guided by the principle of 'push-pull' process where comfortable situations in an external area pull people away from their current location, while uncomfortable situations push people out at the same time. This theory simply explains that people would leave their country of origin because of push factors that chase them away, like low job opportunities, poor living conditions and other factors, and will go to destination countries because of pull factors that attract them, like better pay, better living standards and others. Everett Lee, Lee (1996), Professor of Sociology at the University of Georgia is known for his pioneering theory of migration, which is known as the Push and Pull Theory, or also as Lee' Theory, conceptualized the factors associated with the decision to migrate and the process of migration into the following four categories: (1) Factors associated with the area of origin; (2) Factors associated with the area of destination; (3) Intervening obstacles; and (4) Personal factors. Professor Lee's study on migration approach has made push-pull theory more popular in the study of migration. The theory was developed into a mathematical form (Dorigo & Tobler 1983) and empirical studies distinguish many factors that have impacts on migration decisions, such as income (Banerjee 1991; Borjas *et al.* 1992; Roback 1982; Roback 1988), job satisfaction (Banerjee, 1991), amenities (Roback, 1988), education (Borjas *et al.* 1992; van Ham 2001), and climate (Roback, 1982). Fouberg *et al.* (2009) conclude that push-pull factors include economic conditions, political circumstances, environmental conditions, culture and traditions and technology advances.

World Systems Theory - developed by Immanuel Wallerstein, offers a macro-sociological perspective that views the world as a unified economic and social entity, segmented into core, periphery, and semi-periphery nations. Core nations, such as the United States and Western European countries, hold significant power in the global economy, often exploiting the resources and labour of less developed peripheral nations. World-system theory is a highly political approach to the problem of economic development in the Third World. It was created by policy-oriented intellectuals in countries at a medium level of development to account for their societies' demonstrable inability to catch up to the rich countries (Dadzie, 1980). In its contemporary American form, world-system theory has broadened into a more purely academic enterprise designed to explain the historical rise of the West, as well as the continued poverty of most non-Western societies. But it has generally remained the property of the left, which demands redistribution of the world's economic wealth and which provides theoretical and ideological support for a "new international economic order" (Bhagwati, 1977).

Peripheral countries, typically found in regions like Africa, Latin America, and parts of Asia, rely economically on core nations, primarily exporting raw materials and labour-intensive products. In contrast, semi-periphery nations, including Brazil, India, and China, serve as a bridge, displaying traits of both core and peripheral countries.

This imbalanced exchange fosters systemic inequality, resulting in issues like poverty, underdevelopment, and social injustice in peripheral regions. By comprehensively understanding the dynamics of this world system, we can better grasp the challenges that developing nations face and identify potential strategies to enhance their economic

and social conditions. This theory not only highlights the disparities in global economic relations but also calls for a critical examination of the policies and practices that perpetuate these inequalities.

Dependency Theory

Dependency theory is indeed a compelling framework for understanding global inequality, particularly in the context of the relationships between developed and developing countries. The notion that wealthy nations exploit poorer nations through mechanisms like unequal trade, investment, and aid is central to this theory, as it underscores how these practices perpetuate poverty and underdevelopment in the Global South.

Dependency is a form of unequal international relationship between two sets of countries. One set of countries is called the centre or metropolitan centre, and other set of countries is called the periphery or satellite. Dependency is a type of mechanism which can explain the causes of economic development and underdevelopment. The metropolitan countries are more powerful capitalist countries, but the less developed countries (LDCs) are weaker, and they do not have full-blown capitalism. According to the dependency theory, underdevelopment can be explained by the fact of relations of dominance over the LDCs.

Some of the features of dependency can be found in non-dependent economies (Ghosh, 2019). The distinction between core and peripheral nations is crucial, as it illustrates the power dynamics at play in the global economy. Core nations, such as the United States and Western

European countries maintain dominance, while peripheral nations often in Africa, Latin America, and parts of Asia find themselves in a position of dependency. This structural relationship highlights the systemic nature of global inequality and emphasises the importance of historical and political factors in shaping economic development. Understanding these dynamics can provide valuable insights into the challenges faced by developing nations and inform strategies for fostering greater equity and sustainability in global economic relations.

Empirical Review

The literature shows that economic instability has significant implications for poverty and brain drain across both developed and developing countries. Several studies have examined the relationship between economic growth, unemployment, inflation, inequality, and migration, with findings showing that unstable economic conditions contribute to rising poverty levels and human capital loss.

Egla et al. (2020) examined the factors influencing poverty in European Union and Western Balkan countries using data from 2009 to 2018. The study found that income inequality significantly affects poverty in both regions, while GDP growth, education, investment environment, and unemployment also influence poverty reduction. Similarly, Haataja (1999) investigated the impact of unemployment on poverty in OECD countries and found that unemployment increases poverty in countries with weak social protection systems, whereas countries with stronger welfare systems experienced lower poverty risks.

Oded Stark (2005) examined the economics of brain drain and found that individuals tend to underinvest in human capital in economies affected by migration. Becker et al. (2003) studied migration trends in Italy and discovered that the human capital content of emigrants increased significantly, with emigration negatively affecting the stock of skilled graduates in the country.

In developing countries, Abu (2013) analysed the relationship between economic growth, income distribution, and poverty reduction and concluded that economic growth alone is insufficient for poverty reduction unless accompanied by equitable

income distribution. Guiga & Rejeb (2012) found that government investment in education, healthcare, and rural development significantly reduces poverty and inequality while promoting economic growth in developing countries.

Ul-Hassan et al. (2016) examined the long-run relationship between poverty, inflation, and unemployment using the ARDL approach and found that inflation and unemployment contribute significantly to poverty. Similarly, Shahidur (2012) investigated the effect of inflation on poverty across 115 developing countries and reported a positive relationship between inflation and poverty, particularly in middle-income countries. De la Croix & Docquier (2010) explored the relationship between brain drain and poverty and found that high emigration and poor economic performance jointly contribute to poverty in developing countries. Banya & Zajda (2015) further emphasised that brain drain negatively affects development and slows poverty reduction efforts in Sub-Saharan Africa.

Evidence from Nigeria also shows strong connections between economic instability, poverty, and brain drain. Ajagbe et al. (2024) examined the effects of interest rates and oil prices on economic growth in Nigeria and found that interest rate fluctuations negatively affect growth, while oil prices positively influence the economy. Okafor (2016) found that economic growth in Nigeria has not significantly reduced poverty or inequality, while Onyedikachi & Chinweoke (2013) concluded that poverty and inequality persist despite economic growth due to inadequate human capital development.

Chimobi (2010) examined inflation and economic growth in Nigeria and found a unidirectional relationship running from inflation to economic growth, emphasising the need for price stability. Ademola & Badiru (2016) found positive relationships between unemployment, inflation, and GDP growth, suggesting that Nigeria's oil-driven growth has not translated into improved living standards. Similarly, Ighoshemu & Ogidiagba (2022) revealed that corruption, poor governance, and infrastructural decay contributed to economic hardship and brain drain during the Buhari administration.

Aliyu & Lawal (2024) investigated the determinants of brain drain in Nigeria using the ARDL-ECM approach and found that unemployment positively influences brain drain, while GDP per capita and political stability reduce migration tendencies. Anyanwu (2013) identified factors such as low education, large household size, and regional disparities as major causes of poverty in Nigeria, while Jaiyeola & Bayat (2019) found that poverty was more severe in Northern Nigeria and rural areas. Ogbeide & Agu (2015) also established a causal relationship between poverty and inequality, highlighting the role of unemployment and poor living conditions in worsening poverty levels.

Methodology

The Model

This study is based solely on the Dependency theory, and the model is similar to the model of Ekpeyong, Paul (2023). His study employed the use of the asymmetric Non-linear Autoregressive Distributed Lag (NARDL) technique to explore the relationship between unemployment, inflation, GDP growth rate, Population growth and Poverty (Headcount) in Nigeria. And also, the model of Aliyu. & Lawal (2024) in their study of determinants of brain drain would be adapted.

Model 1

The functional form of this study is presented as follows: $y = f(x)$

$y = f(X1, X2, X3, X4)$ .....(3.1)

Where,

Y is the dependent variable, which represents POV

$X_1, X_2, X_3,$ and X_4 are the independent variables, which are given as INFL, EXR, GDP and UNEMR.

POV=f (INFL, INR, GDPGRT, UNEMR) .....(3.2)

Where;

POV represents poverty, INFL represents inflation, INR represents interest rate, UNEMR represents unemployment, and GDPGRT represents GDP growth

Therefore, the econometric form of the model is written as;

= 0+ 1 + 2 IN + 3 R+ 4*GDPGRT*+ t..... (3.3)

Model 2

y= *f* (x)..... (3.4)

y= *f* (X_1, X_2, X_3, X_4) ..... (3.5)

NM = *f* (INFL, INR, GDPGRT, UNEMR)

Where;

NM represents net migration, INFL represents inflation, INR represents interest rate, GDPGRT represents GDP growth, and UNEMR represents unemployment.

Therefore, the econometric form of the model is written as;

NM= 0+ 1 + 2IN + 3 R+ 4*GDPGRT*+ t..... (3.6)

Data for the study

The data for the study covered the period from 1990 to 2023 based on data availability. Data for poverty, net migration, GDP growth and inflation rate were obtained from World Development Indicators. Interest rate and unemployment rate were obtained from the CBN statistical bulletin.

Results and discussion

Table 4.1: Descriptive Statistics

	GDP GRT	**INFL**	**INR**	**UNEMP**	**NM**	**POV**
Mean	4.2457	18.2780	7.4855	4.8828	329.0000	49.6235
Median	4.2129	12.9417	7.3339	4.0209	13838.50	50.7000
Maximum	15.3291	72.8355	11.064	9.7880	107212.0	58.4000
Minimum	-2.0351	5.38800	3.2683	3.7000	-145917.0	42.7000
Std. Dev.	3.9055	15.9020	1.6227	1.8588	60065.37	5.8601
Skewness	0.5004	2.18038	0.0665	1.7099	-0.3773	0.2272
Kurtosis	3.4865	6.85509	3.4194	4.3414	2.4651	1.6873
Jarque Bera	1.7546	47.9940	0.2743	19.118	1.2121	2.7335
Probability	0.4159	0.0000	0.8718	0.0000	0.5454	0.2549
Sum	144.3556	621.4536	254.5074	166.0161	11186.00	1687.200
Observation	33	33	33	33	33	33

Source: Author's computation using E-views12 (2025)

Table 4.1 presents the descriptive statistics of the variables used in the study. The GDP growth rate recorded an average value of 4.25%, indicating moderate economic growth

during the study period. The noticeable difference between the minimum and maximum values reflects fluctuations in economic performance over time. The standard deviation of 3.91 suggests moderate variation in GDP growth, while the positive skewness indicates that the variable experienced some relatively high growth periods. The unemployment rate recorded an average value of 4.88%, with a moderate level of dispersion across the study period. The wide gap between the minimum and maximum values indicates variations in labour market conditions over time. The high positive skewness shows that unemployment experienced periods of unusually high rates, while the leptokurtic nature of the series suggests the presence of extreme observations.

Inflation rate had an average value of 18.28%, indicating persistent inflationary pressure in the economy. The very high standard deviation of 15.90 reflects substantial fluctuations and macroeconomic instability during the study period. The large difference between the minimum and maximum inflation rates further confirms the existence of periods of extremely high inflation. The variable is positively skewed and leptokurtic, indicating the presence of extreme inflationary episodes. Interest rate recorded an average value of 7.49%, with relatively low variability compared to other macroeconomic variables. The small standard deviation suggests relative stability in interest rate movements over time. The distribution of the variable is approximately symmetric, while the kurtosis value indicates slight concentration around the mean. Net migration recorded a high average value with very large fluctuations over the study period, as indicated by the substantial standard deviation. The difference between the minimum and maximum values suggests instability in migration patterns in Nigeria. The negative skewness indicates that the distribution experienced more extreme declines than increases during some periods. The poverty headcount ratio recorded an average value of 49.62%, indicating a high level of poverty during the study period. The moderate standard deviation suggests some variation in poverty levels across the years, while the difference between the minimum and maximum values reflects changes in living conditions over time. The variable is slightly positively skewed and platykurtic, indicating a relatively stable distribution without extreme fluctuations.

Overall, the descriptive statistics reveal considerable volatility among major macroeconomic variables, particularly inflation and migration, while poverty levels remained persistently high throughout the study period.

Table 4.2: Results of Augmented Dickey-Fuller Unit Root Test

AUGMENTED DICKEY-FULLER TEST					
AT LEVELS			**AT FIRST DIFFERENCE**		**ORDER OF INTEGRATION**
TREND AND INTERCEPT			**TREND AND INTERCEPT**		
VARIABLES	**ADF T-STATISTICS**	**PROB**	**ADF T-STATISTICS**	**PROB**	
POV	-2.275	0.434	-5.589	0.000	I (1)
NM	-5.27	0.000	--	--	I (0)
INFL	-2.480	0.335	-9.798	0.000	I (1)
INR	-3.853	0.026	--	--	I (0)
GDP GRT	-3.647	0.040	--	--	I (0)

UNEMP	-0.039	0.993	-4.929	0.002	I (1)

Source: Author's computation using E-views 12 (2025)

Table 4.2 shows the results of the unit root test. From the ADF test results, it is observed that at 5% significance level, all the variables are either stationary at level {I (0)} or at first difference {I (1)}. This is because the decision criterion is met at those points, resulting in the acceptance of the alternative hypothesis. The Phillips-Perron test shall be used to verify this result.

Table 4.3: Results of Phillip Perron Unit Root Test

PHILLIP PERRON TEST					
AT LEVELS			**AT FIRST DIFFERENCE**		**ORDER OF INTEGRATION**
TREND AND INTERCEPT			**TREND AND INTERCEPT**		
VARIABLES	**PP T - STATISTICS**	**PROB.**	**PP T – STATISTICS**	**PROB.**	
POV	-2.286	0.430	-5.589	0.000	I (1)
NM	-5.27	0.000	--	--	I (0)
INFL	-2.771	0.217	-4.544	0.005	I (1)
INR	-3.535	0.052	--	--	I (0)
GDP GRT	-3.781	0.031	--	--	I (0)
UNEMP	-1.973	0.594	-4.359	0.008	I (1)

Source: Author's computation using E-views 12 (2025)

Table 4.3 shows the results of the unit root test**.** From the PP test results, it is observed that at 5% significance level, all the variables are either stationary at level {I (0)} or at first difference {I (1)}. This is because the decision criterion is met at those points, resulting in the acceptance of the alternative hypothesis. Because the time series variables have a mixed order of integration, the Autoregressive Distributed Lag technique will be employed to estimate the models, as well as to examine the short-run and long-run relationships. This will also require the performance of a bound testing approach.

Table 4.4: Bound Cointegration test results Model 1

Test Statistic	**Value**	**K**
F-statistic	1.955125	4
Critical Value Bounds		
Significance	**I (0) Bound**	**I (1) Bound**
10%	2.2	3.09
5%	2.56	349
2.5%	2.88	3.87
1%	3.29	4.37

Source: Author's computation using E-views 12 (2025)

From the bounds' co-integration test conducted for model 1 with the dependent variable, Poverty, the F-Statistic value of 1.955125, as shown in Table 4.4 above, is less

than the lower bound of the critical value at the 5% level of significance, 2.56 and less than the upper bound of the critical values at the 5% level of significance, 3.49. Therefore, there is no long-run relationship between Poverty Rate, Interest Rate, Inflation Rate, Unemployment Rate and GDP growth rate.

Table 4.5: Bound Cointegration test result Model 2

Test Statistic	**Value**	**K**
F-statistic	4.563159	4
Critical Value Bounds		
Significance	**I (0) Bound**	**I (1) Bound**
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: Author's computation using E-views 12 (2025)

From the bounds' co-integration test conducted for the second model with the dependent variable net migration, the F-Statistic value of 4.563159, as shown in Table 4.5 above, is greater than the lower bound of the critical value at the 5% level of significance, 2.56 and greater than the upper bound of the critical values at the 5% level of significance, 3.49. Therefore, there is a long-run relationship between Net migration, Interest Rate, Inflation Rate, Unemployment Rate and GDP growth rate.

Estimation of Autoregressive Distributed Lag (ARDL) Model

Short Run ARDL Model Estimation

Table 4.6 Short-Run Auto Regressive Distributed Lag (ARDL)- Model 1

Short-Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(INFL)	0.052374	0.019118	2.739530	0.0192
D(INR)	-0.511501	0.134066	-3.815278	0.0029
D(UNEMP)	-0.074886	0.252726	-0.296315	0.7725
D (GDP GRT)	-0.247801	0.078485	-3.157286	0.0091
CointEq (-1)*	-0.006398	0.001549	-4.130727	0.0017

Source: Author's computation using E-views 12 (2025)

The short-run ARDL results show that inflation rate has a positive and statistically significant effect on poverty, indicating that increases in inflation worsen poverty levels in the short run. Interest rate has a negative and statistically significant effect on poverty, suggesting that higher interest rates reduce poverty during the period under consideration.

Similarly, unemployment rate has a negative effect on poverty, although the relationship is statistically insignificant. GDP growth rate also has a negative and statistically significant effect on poverty, implying that increases in economic growth reduce poverty levels in the short run. The coefficient of determination (R^2) indicates that

about 75% of the variations in poverty are explained by the explanatory variables included in the model, while the error correction term is negative and statistically significant, confirming the model's adjustment toward long-run equilibrium.

Table 4.7 Short-Run Auto Regressive Distributed Lag (ARDL)- Model 2

Short-Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(INFL)	0.100880	0.068215	1.478848	0.1774
D(INR)	0.688663	0.309561	2.224644	0.0568
D(UNEMP)	0.942294	0.583582	1.614673	0.1450
D (GDP GRT)	-0.226464	0.190308	-1.189984	0.2682
CointEq(-1)*	-1.114180	0.299151	-3.724469	0.0058

Source: Author's computation using E-views 12 (2025)

The short-run ARDL results show that inflation rate has a positive but statistically insignificant effect on net migration, indicating that increases in inflation tend to increase migration in the short run. Interest rate also has a positive and statistically insignificant effect on net migration, suggesting that higher interest rates are associated with increased migration during the study period.

Similarly, the unemployment rate exerts a positive but statistically insignificant effect on net migration, implying that rising unemployment contributes to increased migration flows. In contrast, GDP growth rate has a negative and statistically insignificant effect on net migration, indicating that improvements in economic growth tend to reduce migration in the short run. The adjusted coefficient of determination shows that about 38% of the variations in net migration are explained by the explanatory variables included in the model, while the remaining variations are influenced by factors outside the model. The error correction term is negative and statistically significant, confirming the model's adjustment toward long-run equilibrium.

Table 4.8 Long-Run Auto Regressive Distributed Lag (ARDL)- Model 2

Long-Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
INR	-0.072392	1.018435	-0.071081	0.9451
INFL	0.174622	0.166090	1.051371	0.3238
GDP GRT	0.716093	0.755520	0.947815	0.3710
UNEMP	0.960753	0.960753	0.681196	0.5150
C	2.358596	16.23159	0.145309	0.0053

Source: Author's computation using E-views12 (2025)

The long-run ARDL results show that the inflation rate and unemployment rate have positive but statistically insignificant effects on net migration, indicating that increases in these variables tend to increase migration in the long run. Interest rate has a negative and statistically insignificant effect on net migration, suggesting that higher interest rates reduce migration over time.

Similarly, GDP growth rate has a positive but statistically insignificant effect on net migration, implying that increases in economic growth are associated with higher

migration in the long run, contrary to the a priori expectation.

Overall, the findings suggest that economic instability variables influence net migration in Nigeria, although their long-run effects are statistically insignificant.

Post-Estimation Tests

Table 4.9: Serial Correlation Test Result – Model 1

F-statistic	0.506710	Prob. F(2,9)	0.4928
Obs*R-squared	1.446819	Prob. Chi-Square(2)	0.2290

Source: Author's computation using E-views12 (2025)

The Breusch-Godfrey test showed that there was no serial correlation issue in the model.

Table 4.9: Serial Correlation Test Result - Model 2

F-statistic	0.175085	Prob. F(2,22)	0.6791
Obs*R-squared	0.220737	Prob. Chi-Square(2)	0.6385

Source: Author's computation using E-views12 (2025)

The Breusch-Godfrey test showed that there was no serial correlation issue in the model.

Table 4.10: Heteroskedasticity Test Result – Model 1

F-statistic	3.421973	Prob. F(1,29)	0.0753
Obs*R-squared	3.262024	Prob. Chi-Square(1)	0.0709

Source: Author's computation using E-views12 (2025)

The result showed that the ARCH test showed there was no heteroscedasticity in our model.

Table 4.11: Heteroskedasticity Test Result – Model 2

F-statistic	0.038848	Prob. F(1,30)	0.8451
Obs*R-squared	0.041384	Prob. Chi-Square(1)	0.8388

Source: Author's computation using E-views12 (2025)

The result showed that the ARCH test showed there was no heteroscedasticity in the model.

Table 4.12: Multicollinearity Test Result – Model 1

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
INR	0.038399	44.21364	1.832803
INFL	0.002466	22.19566	7.717000
GDP GRT	0.015985	9.628453	3.962901
UNEMP	0.122703	66.56512	8.640377
C	46.13688	875.8914	NA

Source: Author's computation using E-views12 (2025)

The VIF test showed that there is no multicollinearity in the model.

Table 4.13: Multicollinearity Test Result – Model 2

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
INR	0.062975	37.88748	1.194491
INFL	0.000846	25.16875	1.063714

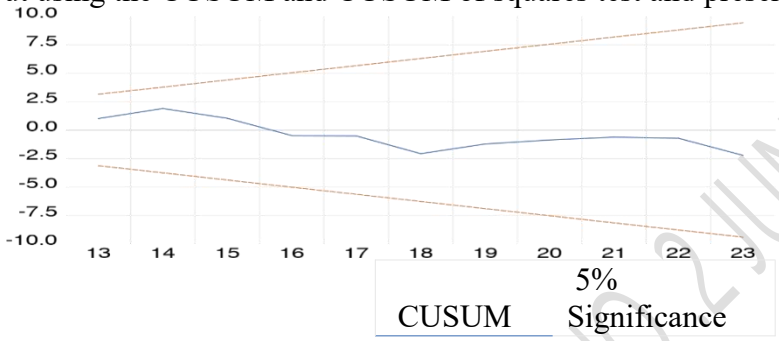
GDP GRT	0.019120	3.808220	1.733252
UNEMP	0.060814	11.24794	1.405050
C	14.88945	100.1102	N/A

Source: Author's computation using E-views12 (2025)

The VIF test showed that there is no multicollinearity in the model.

Figure 4.1: Plot of cumulative sum of recursive residuals (CUSUM) for Model 1

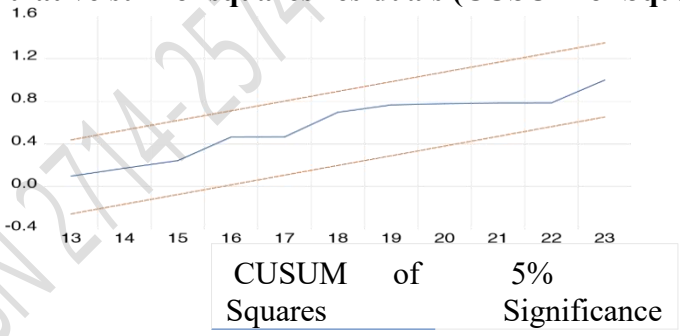
This was carried out using the CUSUM and CUSUM of squares test and presented as follows.



Source: Author's computation using E-views12 (2025)

Figure 4.1 shows that there are two lines: the red line represents the 5% significance level, while the blue line represents the CUSUM stability line. If the blue line falls within the two red lines, then the model is stable. Conversely, if the blue line is outside the two red lines, the model is unstable. Observing the graph shows that the blue line falls mostly within the two red lines, indicating that model 1 is stable.

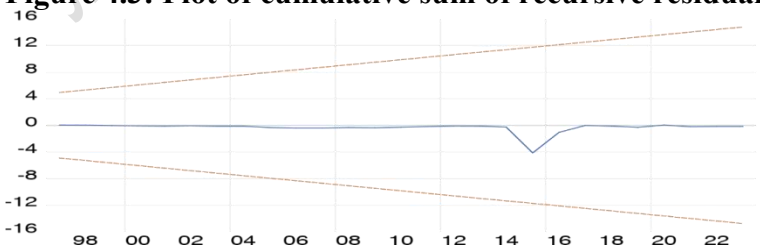
Figure 4.2: Plot of cumulative sum of squares residuals (CUSUM of Squares) for Model 1



Source: Author's Computation Using E-views 12 (2025)

Figure 4.2 shows that there are two lines: the red line represents the 5% significance level, while the blue line represents the CUSUM stability line. If the blue line falls within the two red lines, then the model is stable. Upon analysing, the blue line falls mostly within the two red lines, indicating that Model 1 again is stable based on the Cusum of squares.

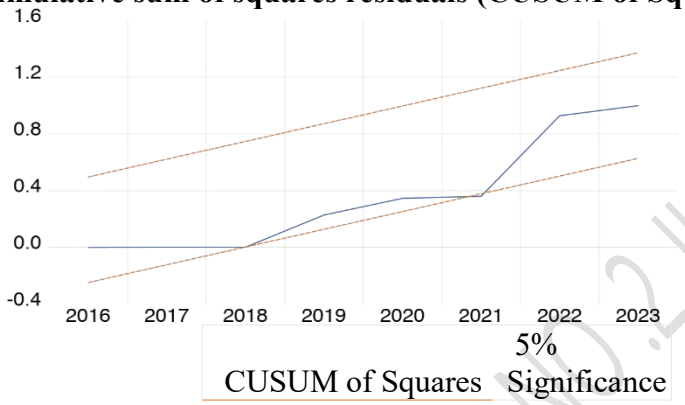
Figure 4.3: Plot of cumulative sum of recursive residuals (CUSUM) for Model 2



Source: Author's computation using E-views12 (2025)

Figure 4.3 shows that there are two lines: the red line represents the 5% significance level, while the blue line represents the CUSUM stability line. As the blue line falls mostly within the two red lines, indicating that Model 2 is stable.

Figure 4.4: Plot of cumulative sum of squares residuals (CUSUM of Squares) for Model 2



Source: Author's computation using E-views12 (2025)

From Figure 4.4, if the blue line falls within the two red lines, then the model is stable. Conversely, if the blue line is outside the two red lines, the model is unstable. We see that the blue line falls mostly within the two red lines, indicating that the model is stable. Therefore, we concluded that Model 2 was stable.

Table 4.14: Ramsey RESET Test Result – Model 1

Test	F-statistics	Probability
Ramsey RESET	1.796396	0.0902

Source: Author's computation using E-views12 (2025)

The Ramsey RESET test result showed that there is normality. Therefore, the residuals of the model follow a normal distribution.

Table 4.15: Ramsey RESET Test Result – Model 2

Test	F-statistics	Probability
Ramsey RESET	1.796396	0.0902

Source: Author's computation using E-views12 (2025)

The Ramsey RESET test result showed that there is normality. Therefore, the residuals of the model follow a normal distribution.

Discussion of Findings

This study examined the effect of economic instability on poverty and brain drain in Nigeria from 1990 to 2023 using the ARDL model. The stationarity tests revealed a mixed order of integration among the variables, making the ARDL estimation technique appropriate for the analysis. The results for model 1 show that inflation rate has a positive and significant effect on poverty in the short run, indicating that rising inflation worsens poverty levels in Nigeria. Interest rate, however, exhibits a negative and significant relationship with poverty, contrary to the a priori expectation, suggesting that

structural economic changes and increased savings and investments may contribute to poverty reduction. Unemployment rate also shows a negative but insignificant relationship with poverty, while GDP growth rate has a negative and significant effect, implying that economic growth contributes to poverty reduction.

For model 2, the findings reveal that inflation rate, interest rate, and unemployment rate have positive relationships with net migration, indicating that worsening economic conditions encourage migration in the short run. GDP growth rate, however, exhibits a negative relationship with net migration, suggesting that improvements in economic growth reduce migration tendencies.

Nevertheless, the coefficients in model 2 were statistically insignificant. The error correction terms for both models were negative and statistically significant, confirming the existence of long-run equilibrium relationships among the variables. The findings are consistent with existing economic theories, which explain that macroeconomic instability contributes to declining welfare conditions, increased poverty, and migration of skilled labour. The results also align with empirical studies such as Ul-Hassan et al. (2016), Shahidur (2012), and Aliyu & Lawal (2024), which found that inflation, unemployment, and poor economic conditions contribute to poverty and brain drain in developing countries.

Overall, the study reinforces the argument that persistent economic instability poses significant risks to poverty reduction efforts and human capital retention in Nigeria.

Conclusion And Policy Implications

This study examined the effect of economic instability on poverty and brain drain in Nigeria over the period 1990 to 2023 using the ARDL model. The findings reveal that inflation rate significantly increases poverty levels, while the GDP growth rate reduces poverty in the short run. Interest rate also shows a significant negative relationship with poverty, whereas unemployment rate exhibits a negative but insignificant effect. In the brain drain model, inflation, interest rate, and unemployment rate were found to have positive relationships with net migration, suggesting that worsening economic conditions encourage migration, while GDP growth rate showed a negative relationship with migration.

Overall, the findings confirm that persistent economic instability contributes to rising poverty and increasing migration of skilled labour in Nigeria.These findings carry important policy implications. First, there is a need for effective macroeconomic policies aimed at controlling inflation and stabilizing the economy in order to reduce the rising cost of living and poverty levels. Second, the government should implement policies that promote sustainable economic growth, employment generation, and diversification of the economy beyond the oil sector to improve living standards and reduce migration pressures. Third, investment in human capital development, education, healthcare, and entrepreneurship programs should be strengthened to create better opportunities for skilled individuals within the country. Finally, policymakers should improve governance, infrastructure, and economic stability to discourage brain drain and retain skilled professionals needed for national development.

Overall, reducing poverty and brain drain in Nigeria requires a stable economic environment supported by sustainable growth policies, employment opportunities, and improved welfare conditions that can enhance living standards and encourage human capital retention.

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