Bima Journal of Science and Technology, Vol. 9(2B) Jul, 2025 ISSN: 2536-6041
E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

Modeling the Relationship Between Exchange Rate Instability and Economic Performance in African Countries

Lumpye Innocent Simji[1], Adenomon M.O[2], and Maijama'a B[3]
Department of Statistics, Nasarawa State University, Keffi.
Corresponding Author: slumpye@gmail.com

ABSTRACT

Exchange rate volatility has created an unstable environment for most factors, such as investment and economic performance. It has, however, severely affected most countries in Africa, which rely on primary export and essential imports. This research investigated exchange rate variability's impact on economic performance in Africa. It sought to apply macroeconomic variables in Standard GARCH and Panel ARDL models; measure exchange rate volatility through the Ggeneralized Autoregressive Heteroskedasticity model; and assess short-run and long-run exchange rate movements: Ex-post facto design research design was adopted, covering the period 1990 to 2023 employing the econometric techniques of GARCH model, panel unit root tests (IPS and LLC), and panel cointegration methods. Pooled Mean Group (PMG) model was used to determined the most appropriate for interpretation using Hausman test results. The output indicated that while the exchange rate value (1.3071) had a positive impact, exchange rate volatility (-0.2784) and inflation (-0.3647) were negatively impacting long-run economic performance. Interest rates also had a positive but statistically insignificant effect (0.2022). In the short run, interest rates positively influenced economic performance (0.0818), while inflation (-0.0707) and exchange rates (-0.6945) had negative effects. Exchange rate volatility (-0.0764) was insignificant. The ECM of (-0.2934) shows that the long-run equilibrium will be restored by a factor of 29% annual correction rate. Recommendations include more stringent inflation-targeting measures that could lessen adverse effects on economic performance. Strengthening(CBN) capacity to maintain price stability is particularly important in interest rate management and open market operations, which would improve economic performance.

Keywords: ARDL, GARCH Model, exchange rate volatility, economic performance.

INTRODUCTION

The debate over exchange rate control has progressed from the breakdown of the gold standard of excellence in the 1930s to Bretton Woods system in the 1940s, fundamental changes in the 1980s, and currency crises in the 1990s shaped the foundation of this study. In recent years, exchange fluctuations have influenced the economies of certain African countries for some recent years mainly due to their reliance on primary commodity exports and essential goods and services imports. There are several economic challenges faced by African countries because of exchange rate movements such as those affecting economic stability, investment planning, and performance in the economy. In spite of the crucial role exchange rates plays in these economies, there have been limited comprehensive research analyzing the long-term and short-term effects of exchange rate volatility on the economic performance of African countries. There was a slight depreciation of the naira against the dollar in Nigeria between 1984 and 1985. For instance, the dollar was worth N0.77 in the country in 1984 and N0.89 in 1985, amounting to an effective depreciation of about 14.2%. During that period, the economic growth rate bounced back from -2.0% to 5.1%. Still, with it being devalued further per dollar from N5, N6, N10, N22 when it fades away at this level, it was pegged 0.07 in 1993 to N21.99 in 1994, a mere 0.32 per cent appreciation.

The US dollar for Nigerian Naira (NGN) has been replaced by the distance in 2023. However, this devaluation draws public attention to these developments, which are in different directions, as a reference to the relationships that exist between the exchange rates and economic output of these countries. Most of these earlier studies (such as Okoh and Nwakwanogo 2024;Udo and Nsikak 2022; Ikechi and Anthony 2020; Ewubare and Ushang 2022; Eyung et al., 2021; and Adenomon and Ojo 2020; Dania and Ogedengbe 2019; Ikechi and Anthony 2020; Akinbode and Ojo 2018; Akinniran and Olatunji 2018; Safuan 2017; Asteriou et al. 2016; Wilson & Choga 2015) used individual countries and specific economic indicators, leaving a gap to study the broader implications of fluctuations in the exchange rate. Moreover, nasal econometric techniques fail to capture sufficiently the dynamic nature of and the complexity with which the exchange rate volatility develops and co-moves with other macroeconomic variables. This, therefore, is the motivation for applying the GARCH model for the analysis of exchange rate volatility while the Panel ARDL model wasutilized in exploring effect of exchange rate instability on the economic performance of African countries for addressing the said gaps.

MATERIALS AND METHODS

Research designed for the research is an ex post facto research approach. The research utilized secondary data in order to find out the impacts of inflation, interest, exchange rates, exchange rates volatility, and export rate on GDP in terms of African countries. Secondary data sets were obtained from the World Bank and the African Development Bank Indicators covering the years 1990 to 2023 (a total of 33 years). The analysis was done using different econometric techniques like the GARCH model, Panel unit root test model to find the order of stationarity of the series. The IPS and LLC tests panel unit root tests were used, which were proposed by Im, Pesaran, Shin (2003) and Levin, Lin, Chu (2002) respectively. The panel co-integration technique was used in determining whether the cointegration exists among the variables. The panel Autoregressive Distributed Lag model was estimated, The Autoregressive Distributed Lag model distinguishes between short- and long-run coefficients and can be reliably used on short sample periods.

GDP= f(INF, EXC,INTR, EXVO) 1

Where GDP = Gross Domestic Product, INF= Inflation rate,EXC = Exchange rate, INTR= Interest rate andExVo = Exchange Rate Volatilty. Equation 2 will be written as:

$$GDP_{it}=\alpha_0+\alpha_1 lnINF_1+\alpha_2 lnEXC_2+\alpha_3 lnINTR_3+ExVo+u \quad 2$$

$a_o$is constant anda_1,a_2, $a_{3,}$ *are* the coefficients of independent variables to be estimated using OLS. Where u_1 is stochastic term

Ggeneralized Aautoregressive Cconditional Heteroscedasticity model

$$\sigma_t^2=\omega+\sum_{i=1}^{p}\alpha_i\varepsilon_{t-i}^2+\sum_{i=1}^{q}\beta_i\sigma_{t-i}^2 3 \quad 3$$

where ε_t^2 is the ARCH term σ_t^2 is the GARCH term. The above model is variance and covariance stationary if the following necessary conditions are satisfied:

$\omega>0$; $\alpha_i>0$, $i=1, 2, ..., q$; $\beta_i>0$, $i=1, 2, ..., p$ and $\sum\alpha_i+\sum\beta_i<1$. It dictates that the shock of volatility shall be long-lasting. In fact Bellserslev, Chou and Kromer (1992) exhibited that all volatilities in a financial time series can be defined using the basic GARCH (1;1) model. The typical GARCH (1;1) is defined as

E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

$\sigma_t^2 = \omega + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 4$ 4

Unit Root Test

$\Delta y_{it} = \gamma_i y_{i,t-1} + \sum_{j=1}^{p} \varphi j \, \Delta y_{i,t-1} \, \varepsilon_{it}$

where $\gamma_i = p_i - 1$ 5

Co-integration test

$y_{it} = x_{it}\beta_i + z_{it}\tau_i + \varepsilon_{it}$ 6

Panel ARDL Model

The paneARDL estimation test consists of three estimates: Pooled mean group, meanggroup, and Dynamic ffixed effect (DFE). The basic model is formed as follows:

Panel Estimations

$lnGDP_{it} = \Theta_{it} + \beta_{0i} lnGDP_{I,t-1} + \beta_{1,i} lnINF_{i,t-1} + \beta_{2,I} lnEXC_{I,t-1} + \beta_{3,i} lnINTR_{i,t-1} + ExVo + \mu i$ 7

The long-run association model utilized pooled mean group and dynamic fixed effect estimators are as follows:

$lnGDP_{it} = \alpha_i + \sum_{j=1}^{p} \lambda_{ij} lnGDP_{i,t-j} + \sum_{j=0}^{q1} \delta_{1ij} lnINF_{i,t-j} + \sum_{j=0}^{q2} \delta_{2ij} lnEXC_{i,t-j}$
$+ \sum_{j=0}^{q3} \delta_{3ij} lnINTR_{3,t-j} + EXVo + \mu it$ 8

Where t mean countries (1, 2, 3...,8), t is years (1990-2023), ($p, q_1, q_2, q_{3,q4}$) There are no short-run error correction relationships above with an error correction model:

RESULTS AND DISCUSSION

$\Delta lnGDP_{it} = \alpha_i + \Phi_i(lnGDP_{i,t-1} - \lambda_1 lnINF_{i,t-1} - \lambda_2 lnEXC_{i,t-1} - \lambda_3 lnINTR_{i,t-1} - \lambda_4 - \lambda_4 lnExVo_{i,t-1} - \lambda_5) + \sum_{j=1}^{p} \lambda_{ij} \, \Delta lnGDP_{i,t-j} + \sum_{j=0}^{q1} \delta_{1ij} \, \Delta lnINF_{i,t-j} + \sum_{j=0}^{q2} \delta_{2ij} \, \Delta lnEXC_{i,t-j} + \sum_{j=0}^{q3} \delta_{3ij} \, \Delta lnINTR_{i,t-j} + \sum_{j=0}^{q4} \delta_{4ij} \, \Delta lnExVo_{i,t-j} + \mu it$ 9

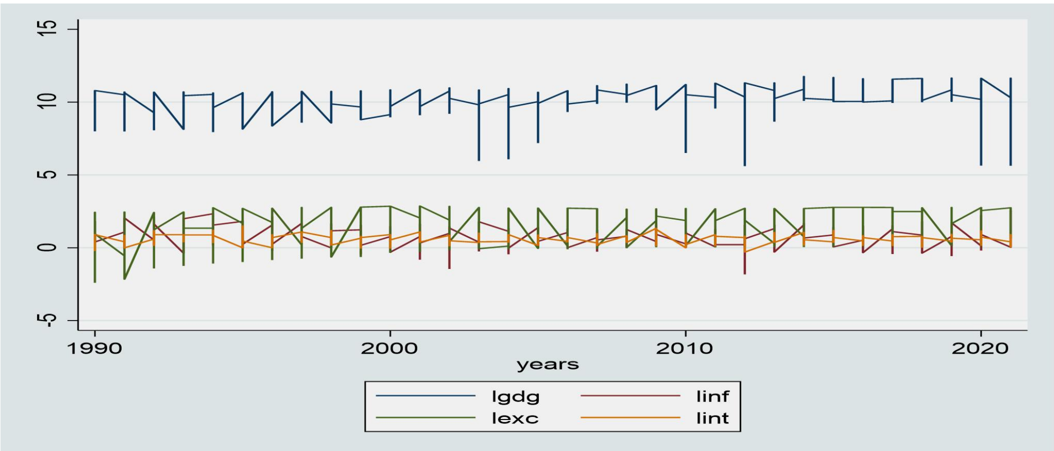

Figure 1: Macroeconomic variables plot.

The lgdp variable (economic performance) shows an overall upward trend with fluctuations, indicating periods of instability or external shocks. The exchange rate (lexc) exhibits significant volatility, suggesting currency instability that may contribute to macroeconomic uncertainties. Inflation (linf) and interest rates (lint) remain relatively stable but fluctuate over time, with inflation showing occasional sharp declines. Interest rates are less volatile than inflation. The data suggests that while exchange rate instability impacts economic performance, inflation and interest rates may have a moderating effect.

Table1: Descriptive Statistic.

	LGDP	LINF	LEXC	LINTR
Mean	10.12241	.7823967	1.493705	.5843259
Std. Dev.	.9779258	.6452862	1.271912	.309673
Maximum	11.75905	2.555203	2.864747	1.497656
Minimum	5.631623	-1.768286	-2.346787	-.2975109
Observations	256	256	256	256

The average LGDP value of 10.12 million dollars suggests that the countries included in the study generally have moderate levels of economic performance. Dispersion of 0.98 shows that there is moderate inconsistency in economic performance across the observations. The average LINF value of 0.78% suggests that the countries in the study generally experience moderate inflation levels on average. The values for the standard deviation show the disparities among the countries. This suggests that while some countries or periods experienced relatively stable price levels, others encountered more volatile or extreme inflationary conditions. The average LEXC value of 1.49 suggests that, on average, the exchange rates in the study are moderate when log-transformed. The standard deviation of 1.27 indicates high variability in exchange rates across countries and periods. The average LINTR value of 0.58 indicates that the overall interest rates in the dataset are moderate.

Table 2: Correlation Matrix.

Variables	**Lgdp**	**Lintf**	**Lexc**	**Lint**
Lgdp	1.0000			
Linf	0.1260	1.0000		
Lexc	-0.2079	-0.5204	1.0000	
Lint	-0.0636	0.0098	0.2587	1.0000

The correlation matrix presents the relationships between the four variables: LGDP (Economic Performance), LINF (Inflation), LEXC (Exchange Rate), and LINTR (Interest Rate). Correlation values range from -1 to 1. A positive correlation of 0.1260 exist between inflation rate and lgdp, which indicates that higher inflation is slightly associated with higher economic performance. This could suggest that mild inflation might coincide with economic growth. A negative correlation of -0.2079 exists between lexc and lgdp, the correlation suggests that exchange rate instability or depreciation is modestly associated with lower economic performance. This indicates that currency volatility might undermine growth, though the effect is not pronounced. Interest rate as well shows negative correlation value of -0.0636 with lgdp, this implies that interest rates have little to no impact on economic performance in this dataset

Bima Journal of Science and Technology, Vol. 9(2B) Jul, 2025 ISSN: 2536-6041
E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

Table 3: Unit Root Test Results for Stationarity of Variables.

Variables		Statistics	Prob.	Order of integration
LGDP	Unadjusted t	-5.6731	0.0001	Order (zero)
	Adjusted t*	-3.6311		
LINF	Unadjusted t	-13.1672	0.0001	Order (one)
	Adjusted t*	-8.4666		
LEXC	Unadjusted t	-14.1672	0.0000	Order (zero)
	Adjusted t*	-8.4666		
LINTR	Unadjusted t	-15.1672	0.0000	Order (one)
	Adjusted t*	-8.4666		

LGDP and LEXC are stationary at their levels (Order 0) since they show and possess consistent statistical properties over time and can be examined in their native forms. On the other hand, LINF and LINTR not stationary at levels. However, they are stationary after first differencing (Order 1) which means that they possess time-dependent trends which require differencing to be stable.

Table 4: Panel Unit Root Test Results (CIPS Test) for Stationarity and Order of Integration.

Variables		Statistics	Prob.	Order of integration
LGDP	T - bar	-4.1048	0.0051	Order (one)
	T – tilde - bar	-3.0587		
	Z- t - tilde-bar	3.3766		
LINF	T - bar	-4.0444	0.0000	Order (zero)
	T – tilde - bar	-3.1337		
	Z – t – tilde - bar	-6.0423		
LEXC	T - bar	-2.7696	0.0007	Order (zero)
	T – tilde - bar	-2.3368		
	Z – t - tilde-bar	-3.1917		
LINTR	T - bar	-5.7631	0.0000	Order (zero)
	T - tilde-bar	-3.9197		
	Z-t-tilde-bar	-8.8495		

LGDP (Economic Performance) has t-bar = -4.1048, Prob. = 0.0051, Order (1), so the null hypothesis of nonstationarity is rejected after differencing for the first time because of the significant p value. This means that LGDP not stationary at levels but stationary after first differentiating. Economic performance trends across the time exhibit dependency that needs to be differenced in order to analyze them.

LINF (Inflation) has t-bar = -4.0444, Prob. = 0.0000, Order (0). This indicates that LINF is stationary at levels, meaning that its statistical properties do not change over time.

LEXC (Exchange Rate) t-bar = -2.7696, Prob. = 0.0007, Order (0). This implies LEXC at levels stationary: exchange rate fluctuations do not show time-dependent trends.

LINTR with t-bar = -5.7631, Prob. = 0.0000, Order (0). This means that LINTR is stationary at levels, and behaves similarly over time.

Thus, results show that inflation (LINF), exchange rate (LEXC), and interest rate (LINTR) are considered stable within, thus making them available for direct analysis. While economic performance (LGDP) is trending, hence time-dependent and thus needs to be differenced for good results in regression or time series modelling.

Bima Journal of Science and Technology, Vol. 9(2B) Jul, 2025 ISSN: 2536-6041
E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

Table 5: Lag Selection Criteria.

Lag	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	25.4804	NA	NA	NA	1.6e-07	-1.46289	-1.39016	-1.22499
1	131.463	211.97	25	0.000	5.1e-10	-7.24739	-6.81103	-5.82003
2	157.481	52.036	25	0.001	5.7e-10*	-7.3201*	-6.52011*	s-4.70327*
3	176.432	37.901	25	0.047	1.5e-09	-6.88799	-5.72437	-3.0817
4	198.279	43.695*	25	0.012	8.2e-09	-6.66281	-5.13555	-1.66704

***optimal lag**

Table 5 provides information about the lag selection process for the panel data model. Lag 2 is the optimal lag, as it minimizes AIC, HQIC, SBIC, and has an acceptable FPE (5.7e-10). Although lag 1 provides slightly better FPE, lag 2 balances both fit and predictive accuracy while capturing additional dynamics in the data. Lag 2 captures the short-term and medium-term dynamics of the variables. The model achieves a good balance between accuracy and complexity. Overfitting is avoided, as adding more lags (for example lag 3 or 4) does not substantially improve fit but increases complexity and reduces predictive performance.

Table 6: Panel Stationarity Test Results Using Various Dickey-Fuller Approaches.

	Statistic	p-value
Modified Dickey – Fuller t	-2.1814	0.0187
Dickey – Fuller t	-2.5125	0.0242
Augmented Dickey – Fuller t	3.0568	0.0073
Unadjusted modified Dickey – Fuller t	-5.2333	0.0000
Unadjusted Dickey – Fuller t	-2.3235	0.0101

Table 6 indicates evidence of a long-run equilibrium relationship between the variables. Dickey–Fuller t (p = 0.0242), The p-value is less than 0.05, so we reject the null hypothesis of no cointegration. This result also supports the presence of cointegration.

Table 7: Panel Stationarity Test Results Using Phillips–Perron and Augmented Dickey–Fuller Methods.

	Statistics	p-value
Modified Phillips – Perron t	2.7365	0.0031
Phillips – Perron t	3.4704	0.0003
Augmented Dickey – Fuller t	3.3441	0.0004

Modified Phillips–Perron t (p = 0.0031) test statistic is significant with the probability value than 0.05. This result leads to rejecting the null hypothesis, providing evidence of cointegration among the variables. Phillips–Perron t (p = 0.0003). The statistic is highly significant with a p-value well below 0.05. This result also fails to accept the null hypothesis and indicates a long-run relationship among the variables. Augmented Dickey–Fuller t (p = 0.0004). probability value is less than 0.05, allowing rejection of the null hypothesis. This confirms the existence of cointegration. All three test statistics provide strong evidence to reject the null hypothesis

Bima Journal of Science and Technology, Vol. 9(2B) Jul, 2025 ISSN: 2536-6041

E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

GARCH Model

Table 8: ARCH family regression

Lgdp	Coef.	OPG Std. Error	t-Statistic	P>|z|
Linf	.0376751	.0213011	1.77	0.077
Lexc	-.0212636	.0075764	-2.81	0.005
Lint	-.034492	.0484175	-0.71	0.476
_cons	10.11833	.0333323	303.56	0.000
Arch				
L1	1.0541	.1290858	8.17	0.000
L2	-.0628752	Na	Na	Na
L3	-.3748665	.1003958	-3.73	0.000
Garch				
L1	.2542453	.0694661	3.66	0.000
L2	.4719441	.0712198	6.63	0.000
L3	-.1431573	.0180695	-7.92	0.000
_cons	-.00011	.0001671	-0.66	0.510

Table 8 presents the results of a GARCH model, which combines the ARCH component to model volatility clustering with additional lagged conditional variance terms. The focus is on modelling the mean and the variance equations of the dependent variable Lgdp (economic performance). Lag 1 (L1) Coefficient: 0.25420, p=0.000p = 0.000 (highly significant). Firstlag of conditional variance has a positive and significant effect on current volatility, indicating that past volatility contributes to current volatility. Lag 2 (L2), Coefficient: 0.47190, p=0.000 (highly significant). The second lag of conditional variance as well has a positive and significant impact, showing persistence in volatility. Lag 3 (L3) Coefficient: −0.1432-0, p=0.000 (highly significant). The third lag of conditional variance reduces current volatility, indicating that volatility from earlier periods has a dampening effect.

Conditional Volatility

A conditional volatility plot is a graphical representation of the variability or fluctuation of a time series based on a conditional heteroskedastic model, such as an (ARCH) and (GARCH) model. It shows how the volatility (variance of a variable) changes over time, conditional on past information, such as previous values of the variable and its past volatility.

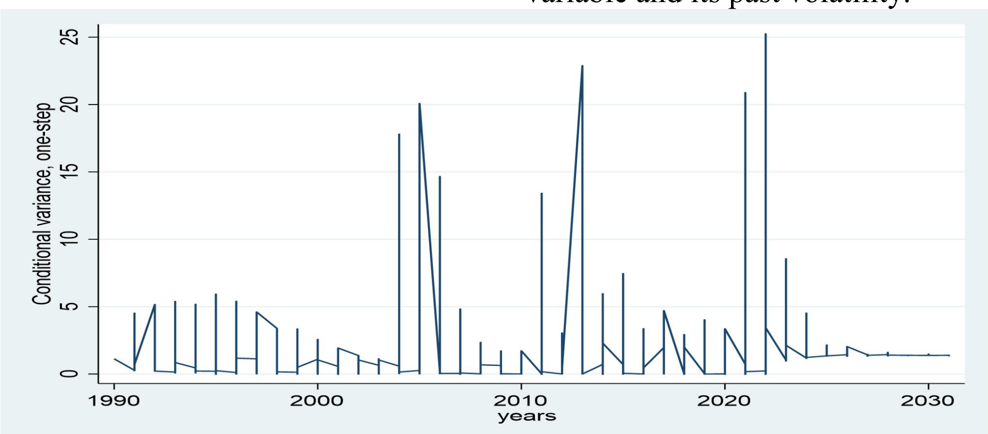

Figure 2: Condidtonal variance.

In Figure 2,the ARCH/GARCH model is shown applying to exchange rates between the selected countries. Periods of low volatility are interrupted by infrequent spikes between 1990 and the beginning of 2000. From 2005 to 2010, several sudden spikes of rise can be related to episodes of instability or shocks in financial markets. Dominant spikes between 2015 and 2023 reach above 20 on a variance scale, indicating episodes of extremely high uncertainty. The peaks of the variance sound crises in the foreign exchange market, shocks to financial markets, or macroeconomic instability. Probably, the introduction of new types of flapping caused late 2010s and early 2020s instabilities. It could be increasing oil price movements, inflation surges, all kinds of changes in policy, and so on through foreign shocks like global financial crises. Through 2022 and beyond, however, there seems to be declining volatility and thus an indication of a path toward stabilization for the exchange rate and macroeconomics as well.

Table 9: VIF.

Variables	VIF	1/VIF
Linf	1.54	0.649643
Lexc	1.42	0.703744
Lintr	1.12	0.892904
ExCVol	1.04	0.960872
Mean vif	**1.28**	

The variance inflation factor values for all the variables are less than 10 and the tolerance values for all the variables are greater than 0.10. Which signified that there is no problem of multicollinearity.

Table 10: Heteroscedasticity.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity H_o: Constant variance Variables: fitted values of LGDP chi2(1) = 0.64	Prob > chi2 = 0.5021

Breusch-Pagan/Cook-Weisberg test employed in this study, the chi2 value of 0.64 coupled with a p-value of chi2 at 0.5021 indicate lack of heteroscedasticity.

Hausman Specification Test

Table: Hausman Test.

Variables	(b) Pmg	(B) Dfe	(b-B) Difference	sqrt(diag(V_b-V_B))
Linf	-.3647375	-.2862486	-.0784889	1.30177
Lexc	1.307136	.579039	.7280974	2.227828
Lint	.2021763	.0711995	.1309768	2.548787
ExcVo	-.2783914	-.3259881	.0475967	.3294721
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 0.21 Prob > chi2 = 0.9948				

Hausman specificationn result indicates that there is no significant systematic difference between the coefficients estimated by the PMG and DFE models, as the p-value is very high (0.9948). Therefore, accept the null hypothesis, indicating that both models are similarly efficient and consistent for this dataset.

Bima Journal of Science and Technology, Vol. 9(2B) Jul, 2025 ISSN: 2536-6041

E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

Table 12: PMG Long Run Result.

Variable	Coefficients	Standard. Error	Z	P-value
Linf	-.3647375	.1259372	-2.90	0.004
Lexc	1.307136	.215096	6.08	0.000
Lintr	.2021763	.2465083	0.82	0.412
ExcVo	-.2783914	.0318325	-8.75	0.000

The dependent variables (economic performance) are being related to independent variables. The results are drawn from the long-term equilibrium relationships among these variables. The negative coefficient on inflation of -0.3647 indicates that in the long run, an increase in inflation bears a decrease in the dependent variable (perhaps economic output). This relationship is statistically significant, as shown by the Z-statistic of -2.90 and the p-value of 0.004 (below 0.01). This means, in other words, that inflation negatively affects the dependent variable, this finding is in line with that of Ewubare and Ushang (2022). There is also positive relationship between exchange rate and economic performance at 1% (as the p-value is 0.000), which means that changes in exchange rate changes have a positive long-term effect on the dependent variable. The finding corroborates with Okoh and Nwakwanogo (2024) and Eyung et al., (2021) and Akinniran and Olatunji (2018).

However, the Z-statistic of 0.82 and the p-value of 0.412 tell us that this relationship between interest rate and economic performance is not statistically significant at 5% (because the p-value is greater than 0.05). Thus, interest rates in this model do not have significant long-term effects on the dependent variables. Again, Z-statistic of -8.75 and a probability value of 0.000 suggest that there is statistically significant relationship between exchange volatility and economic performance. This finding agreed with that of Udo and Nsikak (2022), Olamide (2022) and Dania and Ogedengbe (2019) whose findings indicated that exchange rate volatility have a negative impact on the dependent variable both short and long run and contradict that of Akinbode and Ojo (2018) who found that exchange rate volatility have an insignificant impact on the economic growth.

Table 13: Pooled Mean Group Short Run Model and Error correction model.

Variables	Coefficient	Std. Error	Z	Prob.*
__ec	-.2934121	.1524844	1.92	0.044
linf D1.	-.0707316	.0425359	-1.66	0.096
lexc D1.	-.6944654	.3178398	-2.18	0.029
lint D1.	.0817766	.0395101	2.07	0.038
ExcVo D1.	-.0764443	.0550837	-1.39	0.165
_cons	-2.88137	1.501137	-1.92	0.055

The error correction term is -0,2934, indicating the system adapts to 29.34% per period to correct the short-term deviation from the long-term balance. This indicates an important adaptation process that returns to long-term balance, with negative indications indicating that the dependent variable moves in the opposite direction of deviation to restore balance. Probability value of 0.044 shows that the adjustment process is statistically significant to 5%. The Z-statistics and P-values of -1.66 and 0.096 suggest that this relationship is slightly significant for 10% and equally significant

E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

5%, but not statistically significant. This indicates that the effects of inflation on the dependent variables are less robust in the short term. The Z-statistic of -2.18 and P-value of 0.029 suggest that this relationship is statistically significant for 5%. Z statistics and P values of 2.07 and 0.038 indicate that this effect is statistically significant to 5%. This means that interest rates have a positive effect on the dependent variable. However, a Z-statistic of -1.39 and a P-value of 0.165 suggest that this effect at the 5% level is not statistically significant.

CONCLUSION

Based on the findings of the study, the long-run analysis shows that inflation has a significant negative effect on economic performance, confirming that higher inflation reduces economic output. Conversely, the exchange rate positively and significantly influences economic performance, suggesting that favourable exchange rate movements support growth. Exchange rate volatility negatively impacts economic performance, highlighting the destabilizing effects of fluctuations. Interest rates, however, do not have a significant long-term impact. On the other hand, in the short run, the model adjusts to long-term equilibrium at a rate of about 29.34% per period, indicating a steady correction of deviations. Inflation's short-term effect is weak and only marginally significant, while currency depreciation significantly reduces economic performance. Interest rates have a positive and statistically significant short-term effect. Exchange rate volatility does not significantly affect short-run economic performance.

Based on the findings and conclusion, the study therefore, recommended that;

i. Since inflation negatively affects economic performance in the long run, policymakers particularly the Central Bank should adopt tight and proactive monetary policies aimed at price stability. This includes controlling money supply growth and managing interest rates to prevent excessive inflation.

ii. Given the positive long-term impact of exchange rates on economic performance, the government should implement policies that support a stable and competitive exchange rate. This can be achieved through foreign exchange market reforms, building foreign reserves, and minimizing speculative activities.

iii. As exchange rate volatility significantly harms economic growth, it is critical to implement mechanisms that reduce abrupt fluctuations. Strategies may include a managed float exchange rate regime, better forecasting, and hedging tools for businesses exposed to foreign currency risks.

REFERENCES

Adejumo M. O and Ogunbunmi S.T (2018) Macroeconomic Indicators and Economic Performance in Selected Sub Sahara African Countries: Panel Generalized Method of Moment Approach. International Journal of Contemporary Research and Review, Vol. 9, Issue. 12, Page no: ME 21179-21189.

Adekunle, O. A., Alalade, Y.S. A. & Okulenu, S. A.(2016). Macro-economic variables and its impact onNigerian capital market growth: IIARD International Journal of Economics and Business.

Adenomon M.O and Ojo O.L (2020) Autoregressive Distributed Lag Modeling of The Effects Of Some Macroeconomic Variables On Economic Growth In Nigeria. Article in Folia Oeconomica Stetinensia. Volume 20 (2020) Issue 2.

Akinbode, S. O., & Ojo, O. T. (2018). The effect of exchange rate volatility on agricultural exports in Nigeria: An autoregressive distributed lag (ARDL) bounds test approach. Nigerian Journal of Agricultural Economics, 8(1), 11-19.

Akinniran, T. N., & Olatunji, O. V. (2018). Effects of exchange rate on agricultural export in Nigeria. International Journal of Engineering Science Invention, 7(8), 32-40.

Akinlo, A. E., & Adejumo, V. A. (2014). Exchange rate volatility and non-oil exports in Nigeria: 1986-2008. International Business and Management, 9(2), 70-79.

Asteriou, D., Masatci, K., Pılbeam, K. (2016), Exchange rate volatility and international trade: International evidence from the MINT countries. Economic Modelling, 58, 133-140.

Dania, E. N., & Ogedengbe, F. A. (2019). Impact of exchange rate volatility on non-oil export.

Ewubare, D. B., & Ushie, U. A. (2022). Exchange rate fluctuations and economic growth in Nigeria (1981-2020). International Journal of Development and Economic Sustainability, 10(1), 41-55.

Eyung, E. I. Agbor, F. A. and Orajekwe, J. C. (2021). Exchange rate fluctuation and Nigeria's economic performance

Ikechi, K. S., & Anthony, N. (2020). Global oil price shocks and effects on economic growth: An econometric Investigation of Nigeria. International Journal of Innovation and Economic Development, Inovatus Services Ltd, 6(4), 7-26.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. Journal of econometrics, 115(1), 53-74.

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. Journal of econometrics, 90(1), 1-44.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. Journal of econometrics, 108(1), 1-24.

Okoh, J. O., & Nwakwanogo, S. (2024). Exchange Rate Volatility and Export of Agricultural Produce in Nigeria. International Journal of Development and Economic Sustainability, 12(2), 70-87.

Okorontah, C. F., & Odoemena, I. U. (2016). Effects of exchange rate fluctuations on economic growth of Nigeria. International Journal of Innovative Finance and Economics Research, 4(2), 1-7.

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and statistics, 61(S1), 653–670.

Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests.

Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the ppp hypothesis. Econometric theory, 20(3), 597–625.

Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. Econometric theory, 20(3), 597-625.

Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. Journal of applied econometrics, 22(2), 265–312.

Pesaran, M. H., & Shin, Y. (1998). An autoregressive distributed-lag modelling approach to cointegration analysis. Econometric Society Monographs, 31, 371–413.

Pesaran, M. H., & Smith, R. (1995). The role of theory in econometrics. Journal of econometrics, 67(1), 61-79.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1997). Pooled estimation of long-run relationships in dynamic.

E-ISSN: 3115-4662 DOI: 10.64290/bima.v9i2B.1273

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous.

Safuan, S. (2017), Exchange rate volatility and export volume: The case of Indonesia and its main trading partners. European Research Studies Journal, 10(3A), 3-13.

Udo, E. G, & Nsikak, J. J (2022).Exchange Rate and Agricultural Exports in Nigeria. International Journal of Economics, Commerce and Management, Vol. X, Issue 6, June 2022. ISSN 2348 0386.

Westerlund, J. (2007). Testing for error correction in panel data. Oxford Bulletin of Economics and statistics, 69(6), 709–748.

Wilson, C., Choga, I (2015)"Exchange Rate Volatility and Export Performance in South Africa: (2000-2014)", Handbook on Economics, Finance and Management Outlooks , 3, pp. 27- 28,.

World Development Indicator (WDI), (2016).