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Dynamic interaction of Inflation Determinants and Unemployment in Nigeria: Atheoretic Model

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Abstract **Original Research Article**

Inflation and unemployment are some of the key macroeconomic issues with constant policy measures to tackle the macroeconomic issues. The study, explore the nexus between unemployment and inflation determinants in Nigeria. The nexus covers the period of 1990 to 2024. The specific objectives are to examine the dynamic interaction of the identified inflation determinant (Consumers spending, government spending and interest rate) and unemployment. The study specified atheoeretic model of vector auto regressive (VAR) as a suitable model to determine the dynamic interactions. The result reveals the varying interactive level of inflation determinants and unemployment In addition the impulse response function was also conducted to identify the shocks pattern in the system as well as the impulse response function findings shows that all the determinants of inflation has positive nexus with unemployment in Nigeria From the findings therefore the study recommends for caution an control of inflation factors to cushion unemployment in Nigeria.

Keywords: Atheoretic, Variance decomposition, Impulse response function, Inflation determinant.

1.0 INTRODUCTION

The Nigeria economy, has experienced numerous policy interventions, persistently grapple with high inflation, which undermine economic growth, creating an economic environment characterized by several challenges. While globally, stable inflation, low unemployment, and consistent economic growth are seen as indicators of robust economic health, Nigeria's performance has diverged significantly from these ideals. Historically, economic theories like Okun's Law and the Phillips Curve have highlighted the trade-offs and interactions between growth, unemployment, and inflation. However, in Nigeria's case, these relationships appear more complex, influenced by structural issues such as reliance on oil revenue, policy inefficiencies, and external economic pressures, such as exchange rate fluctuations and subsidy reforms.

In recent years, inflation in Nigeria has remained consistently in double digits, reaching a high of 34.80% in 2024, while unemployment rates hover at concerning levels, even surpassing African and global averages. This trend reflects a significant deviation from the Central Bank's inflation target of 6-9% and an increasing strain on the economy. The lack of improvement in unemployment levels and persistent inflation has raised questions about the effectiveness of Nigeria’s macroeconomic policies and the suitability of its inflation-targeting framework. As Nigeria adopts new policies, including floating exchange rates and inflation targeting, it remains critical to understand the structural causes behind these persistent issues and to evaluate the efficacy of recent measures in promoting sustainable economic growth.

Empirical evidence, however, presents mixed findings, particularly in Nigeria. For instance,

studies by Babalola, Saka, and Adenuga (2018) as well as Taylor's Rule suggest that inflation often prompts monetary authorities to raise interest rates, attracting foreign portfolio investment. Yet, persistent inflation can also devalue a currency, reducing international competitiveness and potentially inviting foreign direct investment due to lowered production costs. Hjazeen (2021) demonstrate a negative correlation between unemployment and economic growth, while others, like Okeowo (2023), report that inflation and unemployment positively influence economic growth, a finding contrary to Okun's law. Mohammed, Okoroafor, and Omoniyi (2020) observed an inverse relationship between inflation and unemployment with economic growth, while Dodo and Idris (2022) support the positive effects of unemployment and the negative impacts of inflation on growth. Data shows that Nigeria's unemployment rate rose to 37.7% by 2022, with a simultaneous decline in GDP growth from 8.4% in 2010 to 0.8% in 2022. Inflation, similarly, climbed from 11% in 1981 to 29.9% in 2024. These trends indicate a complex interplay between inflation, unemployment, and economic growth that has yet to be fully understood.

The need for this study, therefore, arises from the apparent disconnect between Nigeria's macroeconomic goals and the outcomes, calling for an in-depth analysis of how inflation and unemployment impact economic growth in the Nigerian context. Addressing this issue could provide insight into more effective policy approaches to foster an environment of stable growth, employment, and controlled inflation.

1.1 Objectives

The main objective is to examine the dynamic interactive impact of inflation determinants on unemployment behavior in Nigeria. However, the specific objectives are: 1.to examine the dynamic interactive effects of consumers spending on unemployment, government spending and interest rate in Nigeria 2.to evaluate the interactive effect of government spending on unemployment, consumers spending and interest rate in Nigeria

3. To assess the dynamic interactive effects interest rate on unemployment consumers spending and government spending in Nigeria 4. To ascertain the level of impulse and decomposition of inflation determinant on unemployment in Nigeria

2.0Theoretical Review

2.1 The Phillips Curve

Hume (1752) and Thornton (1802) laid the theoretical foundations for the Phillips curve. However, the first statistical and empirical corroboration was carried out by Fisher (1926) and later modified by Tinbergen (1936). It was Tinbergen who estimated the alternative shift-augmented wage-change version $W=f(U)+Z$ in which causality runs from unemployment (U) to wage inflation rate (W) and a vector of shift variables (Z) enters to affect wage-unemployment trade-off.

Subsequently, Phillips (1958) conducted a research on stabilisation policy in the United Kingdom. In order to investigate the speed with which input prices responded to excess demand and supply, Phillips plotted a graph of the rate of inflation against the rate of unemployment in the United Kingdom over the period 1862 to 1957. He found an unambiguously negative relation between the rate of inflation and the unemployment rate during the period. Samuelson and Solow (1960) carried out the same analysis for the United States using annual data for the period 1900 to 1960 and confirmed the negative relationship. They named this inverse relationship between the rate of inflation and the rate of unemployment 'the Phillips Curve'.

The Phillips curve quickly became the central point for macroeconomic theory and policy. The curve tended to suggest that a country could choose different combinations of inflation and unemployment rates. Thus a country could combine a high inflation rate with a low unemployment rate and vice versa. The accepted explanation during the 1960's was that a fiscal stimulus, and an increase in aggregate demand, would trigger the following sequence of responses: an increase in the demand for labour will lead to a fall in the pool of the unemployed, an increase in nominal wages as firms compete

for fewer workers, an increase in workers' bargaining power to obtain increases in nominal wages, a rise in wage costs and higher prices as firms pass on to consumers the increase in costs due to rise. Solow and Samuelson (1960) drew a distinction between its demand and supply impulses and most notably, modified the classic Phillips curve by replacing the rate of change of nominal wages with the rate of inflation.

However, Gonda (2015) observed that this modification led to a conclusion with interesting implications for economic policy, in particular, that the desired low unemployment (sought by the Keynesians) is linked to the undesired growth in prices-inflation. The extent of unemployment may be influenced by fiscal and monetary policies. Similarly, Lucas (1987) observed that the historical negative correlation between inflation and unemployment could break down if the monetary authorities attempted to exploit it continuously. Permanently raising inflation in hopes that this would permanently lower unemployment would eventually cause firms to make inflation forecasts and alter their employment decisions. It thus implies that just because high inflation was associated with low unemployment under early 20th century monetary policy does not mean that high inflation should be expected to lead to low unemployment under every alternative monetary policy regime.

Therefore, it can be inferred from the explanations above that, generalizing the postulation of Phillips (1958) is not proper since his study was based on wage induced inflation. Increases in wages unlike any other cost push factors play a dual role. Increase in wages are in part an indication of increase in cost of production and on the other hand increased wages are increased income to labour that translates to higher levels of consumption for goods and services. Once this happens there will be an increase in demand for goods and services and firms will be propelled to employ more hands especially where the use of labour intensive technique is in vogue. But since not all forms of inflation emanate from wage increase, it may be erroneous to assume that inflation must necessarily reduce unemployment.

2.2 Empirical Reviews

Ekekwe and Njoku (2024) examined the impact of inflation on Nigeria macroeconomic performance between 1981 and 2022 utilizing Error Correction Model (ECM) test approach. The results from the per capita income model, revealed that an increase in inflation rate, exchange rate and interest rate erodes the value of the per capita income of the citizens. The result from the private investment model, showed that an increase in inflation rate, exchange rate, and interest rate reduces the level of private domestic investment.

Mohamed (2024) examined the impact inflation dynamics and unemplomet in Sudan during the period from 2000-2022. The study utilized linear region model and found that gross domestic product and exchange rate directly and positively affect inflation rate in Sudan.

Abiodun and Ogun (2019) investigated the asymmetric effect of government spending an employment level in Nigeria. Data collected were analyzed using Non-linear Autoregressive Distributive Lag (NARDL) econometric techniques. The results showed that in the short run, there is positive impact and have more significant effects on output

Trejo-García, Valencia-Romero, Soto-Rosales and Venegas-Martínez. (2024) examined the asymmetric link between Consumers spending on Economic Activity Index in Mexico during the period 1994–2023. The study utilized Nonlinear Autoregressive Distributed lag (NARDL) model and the main empirical finding is increase in consumers spending index have caused different effects in magnitude and sign on economic growth over time.

Okoro and Ife (2024) analyzed the influence of inflation and Stagflation on the economic growth of Nigeria from 2012 to 2024. Study employed the autoregressive distributed lag model the findings indicate that inflation and stagflation has a significant negative impact on economic growth.

Ngoc (2020) empirically investigate the effect of inflation on economic growth using the

Nonlinear Autoregressive Distributed Lag approach for Vietnam over the period 1990-2017. Empirical results provide evidence that the effects of inflation on economic growth are negative and asymmetric in the long run. Chu Sek, and Ismail (2019) investigated the threshold and its impact on inflation-growth relationship Inflation and growth. The study involves 18 developed countries over the period 1980–2016 using Dynamic Panel Threshold Regression (DPTR) model. The results revealed that the impact of inflation on growth in low inflation regimes is positive and statistically significant while for higher inflation regime, the study found inflation are associated with lower economic growth, inflation and growth is negatively correlated and statistically significant.

Ezinne, Idowu and Folake (2019) evaluated the impact of inflation on Nigeria's economic growth for the past four decades, beginning from 1980 to 2019. Data collected were analysed using the Autoregressive Distribution Lag (ARDL) model and the Error Correction Model (ECM). Results indicated that inflation has negatively affected economic growth over the years as it reduces competitiveness as well as lowering the purchasing power of money.

Ezako (2023) analysed the relationship between inflation and economic growth in Burundi using annual data from 1990 to 2020. The ARDL approach is adopted to assess the short and long run relationship between inflation and economic growth. The results showed a negative and significant relationship in the short run between inflation and economic growth. The study assess the relationship between inflation and economic growth which differ from the focus of the present study.

Ekpeyong (2023) study investigates the dynamics of inflation volatility in Nigeria using secondary data for the period of 1995 to 2022. The analysis utilizes the Autoregressive Conditional Heteroskedasticity (ARCH) and Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models to capture time-varying volatility in the inflation rates. The results indicate that inflation display degrees of fluctuations and uncertainties in price movements over different periods.

Omobolanle (2021) investigated the effects of inflation on economic growth in Nigeria within the period 1990 to 2016. The study adopted the use of VECM in estimating the data. The study found that inflation does not have significant effect on economic growth. The study investigated the effect of inflation and economic growth which is outside the scope of the present study.

Adaramola and Dada (2020) examine the influence of inflation on the growth for the period 1980 to 2018. The study employs the autoregressive distributed lag model and found that inflation exert a significant negative impact on economic growth in Nigeria during the period of the study. The study focus on inflation and economic growth which differs from the current study.

Ogu, Adagiri and Abdulsalam (2021) examines the impact of inflation on economic growth in Nig eria, utilizing time series data for the period spanning from 1999 to 2017. The study adopts the Ordinary Least Square (OLS) regression technique and established that inflation has positive but not significant impact on economic growth in Nigeria. The study focus on inflation and economic growth.

Dada, Posu and Maghori (2017) investigated the dynamic relationships between economic growth and inflation in five ECOWAS countries. Annual data covering the period of 1981- 2013 were used. The study employ ARDL bound test to capture the long run and short run dynamic between economic growth and inflation. The result shows that there exists a positive long run equilibrium relationship between inflation and economic growth only in two out of the five countries while in the short run, inflation has negative impact on growth in all but one country.

Soylu, Çakmak, and Okur (2018), investigated the relationship between economic growth and unemployment in Eastern European Countries for the period of 1992 to 2014. The study employed Panel Unit Root, Pooled Panel OLS and Panel Johansen Co-integration tests to estimate the relationship among the variables of the study. The results show that unemployment has affected economic growth positively.

Nwikpo (2023) examined the inflation and unemployment in Nigeria from 1981 to 2022. The study employed ARDL for the analysis and the found that unemployment has a negative long-term and short-term impact on inflation in Nigeria. The study specific goals were to determine the impact of total government spending on inflation in Nigeria.

Orji, Orji and Okafor (2015) examined the inflation and unemployment nexus in Nigeria by testing if the original Phillips curve proposition holds for Nigeria 1970-2011. The study adopted ARDL model and the result reveals that unemployment is a significant determinant of inflation and that there is a positive relationship between inflation and unemployment rate in Nigeria. The study focus on inflation and unemployment which differ from the present study.

Kaiballah (2020), examined the relationship between economic growth and unemployment in Liberia from 2001 to 2019. The Auto Regressive Distribution Lag (ARDL) bounds test is used to decide if the variables have a long run linkage. The study found that there is no long-run association between unemployment and economic growth.

Jean, (2023) examined growth and unemployment in Nigeria spanning 1981 to 2017. The study utilized econometric technique of Autoregressive Distributed Lag (ARDL) model and found that female unemployment has a positive significant influence on economic growth in Nigeria while youth unemployment negatively and significantly influences economic growth.

Jallof and Bah (2023), examined the impact of unemployment on economic growth in Western Balkans using from 2001 to 2021. The study employed the method of Ordinary Least Squares (OLS) for the analyses and the study found that unemployment has positive and statistically significant relationship with economic growth. The study focused on the trade-off between unemployment and economic growth in Western Balkan countries which differs from the present study.

Isubalew (2023) investigated the impact of unemployment on economic growth in Nigeria from the period of 1980 to 2016. The study made used of Ordinary Least Squares (OLS) and found that unemployment have significant impact on economic growth in Nigeria.

Ellen and Wilson (2019) examined the impact of unemployment on economic growth in China for the period of 1991 to 2018. The study employed econometric technique of Autoregressive Distributed Lagged (ARDL). The found that unemployment has negative impact on economic growth in the both short-run and long-run.

Dumebi (2023) examined economic growth, inflation and unemployment in Bhutan utilizing data from 1998 to 2021. The study employed econometric technique of autoregressive distributed lag (ARDL) and found among others that economic growth had no impact on the reduction of unemployment rate in Bhutan both in the short and in the long run.

3.0 METHODOLOGY

3.1 Model specification

The atheoretic model (Vector autoregressive) model specifid as follows

Inflation determinant – unenployment VARModel

$$\begin{bmatrix} UNEt \\ CSPt \\ GVSt \\ INTt \end{bmatrix} = \begin{bmatrix} \alpha 1 \\ \alpha 2 \\ \alpha 3 \\ \mathrm{a}4 \end{bmatrix} + \sum_{k=0}^{n} \binom{n}{k} \begin{bmatrix} \beta 11 & \beta 12 & \beta 13 & \beta 14 \\ \beta 21 & \beta 22 & \beta 23 & \beta 24 \\ \beta 31 & \beta 32 & \beta 33 & \beta 34 \\ \beta 41 & \beta 42 & \beta 43 & \beta 44 \end{bmatrix} \begin{bmatrix} UNEt-1 \\ CSP-1 \\ GVSt-1 \\ INTt-1 \end{bmatrix} + \begin{bmatrix} v1 \\ v2 \\ v3 \\ v4 \end{bmatrix} \qquad 3.4$$

Where:

a_1, a_2, a_3 and a_4 are the vectors of constants; β_{11} … β_{44} are the coefficient of variables of the model while v_1 to v_4 are the vectors of error terms for the VAR of inflation determinant– unemployment Model.

3.2 Result Presentation

Table 3. 1: Result Augmented Dickey-FullerC (ADF) Unit Root Test

Variable	At Level			1st Difference				OI	Remarks
	t-stat	CV at 5%	Prob.	t-stat	CV at 5%	Prob.			
UNE	0.5864	-3.5266	0.5648	-5.6588	-3.5334	0.0760		*I*(1)	Stationary at 1st Diff
CSP	-1.6678	-3.5266	0.7469	-5.9439	-3.5298	0.0001		*I*(1)	Stationary at 1st Diff
GSP	-1.0863	-3.5366	0.9188	-6.0102	-3.5300	0.0001		*I*(1)	Stationary at 1st Diff
INT	-2.6430	-3.5366	0.2646	-6.3527	3.5221	0.0000		*I*(1)	Stationary at 1st Diff

Source: Author's Computation, 2025.

Given the observed fluctuations and random variations in the study variables as evident in figure 4.1, a unit root test was conducted on the study variables to ensure their stability, stationarity and order of integration in the analysis The result of test as reported in table 4.3 revealed that unemployment (UNE), Consumers spending (CSP), government spending (GSP) and interest rate (INT) as determinant of inflation are stationary at first difference

Table 3.2: Result of Residual Correlation Matrix

	UNE	CSP	GSP	INT
UNE	1	0.0065	0.0613	0.0602
CSP	0.0065	1	-0.3163	0.0650
GSP	0.0613	-0.3163	1	0.1545
INT	0.0602	0.0654	0.1545	1

Source: Author's Composition, 2025.

Table 3.2 details the result of residual correlation matric analysis conducted to establish the nature of correlation or relationship between the actual value of a response variable and the predicted value of that variable based on the VAR system model. From the results, the errors in UNE and CSP, GSP and INT are positively correlated; CSP maintains a negative correlation with GSP, but a positive one with INT, and GSP and INT are positively correlated. The result reveals that the deviations from the mean of each variable is close to zero and as such suggest close interactions. This result suggests that there is evidence of more positive interactions among the variables

3.3 Counteraction test Result

The null hypothesis states that, there is no long-run significant relationship and inflation determinant variables. The result is those presented in table 4.2

Table 3.3: Presentation of Result of Johansen Unrestricted VAR Cointergration Rank Test

Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.500459	57.91139	47.85613	0.0043
At most 1 *	0.357392	30.84284	29.79707	0.0378
At most 2	0.219348	13.59624	15.49471	0.0947
At most 3 *	0.096063	3.938811	3.841466	0.0472

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

** denotes rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

Source: Author's Compilation, 2025.

Table .3 above details the result of Johansen Unrestricted VAR Cointergration Rank Test conducted using UNE, CSP, GSP and INT as exodogenous variables. From the result, it is apparent that the single system model has two cointegrating equations; established as the points where trace statistic values 30.84284 and 3.938811are greater than their 5% critical values of 29.79707 and 3.841466 respectively, and their respective probability values are significant at the same level of significance.

Table 4.4: Result of Unrestricted Vector Auto-Regression (UVAR) Test.

Variables	**UNE**	**CSP**	**GSP**	**INT**			**Variables**	**UNE**	**CSP**	**GSP**	**INT**
UNE	-0.323917	0.445857	0.795448	0.476965			GSP	0.066316	-0.310772	0.936404	-0.086174
	(0.58139)	(1.09143)	(0.32770)	(0.22548)				(0.32699)	(0.61384)	(0.18430)	(0.12681)
	[-0.55714]	[0.40851]	[2.42737]	[2.11534]				[0.20281]	[-0.50628]	[5.08075]	[-0.67953]
UNE(-1)	-0.003321	0.025818	-0.054326	-0.061724			GSP(-1)	0.083995	0.402391	-0.172044	-0.046833
	(0.12545)	(0.23550)	(0.07071)	(0.04865)				(0.30198)	(0.56689)	(0.17021)	(0.11711)
	[-0.02648]	[0.10963]	[-0.76830]	[-1.26865]				[0.27815]	[0.70983]	[-1.01079]	[-0.39990]

	-0.002123	0.853418	-0.044136	0.026501			INT	0.029479	0.426866	0.153887	0.972531
	(0.09897)	(0.18579)	(0.05578)	(0.03838)				(0.43552)	(0.81759)	(0.24548)	(0.16891)
CSP	[-0.02145]	[4.59339]	[-0.79120]	[0.69043]				[0.06769]	[0.52210]	[0.62688]	[5.75780]
	0.043121	-0.062607	-0.105927	-0.097183			INT(-1)	0.066443	-0.510248	-0.010622	0.051545
	(0.10868)	(0.20401)	(0.06125)	(0.04215)				(0.43107)	(0.80922)	(0.24297)	(0.16718)
CSP(-1)	[0.39678]	[-0.30688]	[-1.72928]	[-2.30580]				[0.15414]	[-0.63054]	[-0.04372]	[0.30832]
C	34.03563	-9.562512	-17.24462	-8.331440							
	(13.9627)	(26.2116)	(7.87003)	(5.41510)							
	[2.43761]	[-0.36482]	[-2.19118]	[-1.53856]							

R-squared	0.483343	0.784984	0.989944	0.993795		Adj. R-squared	0.350013	0.729495	0.987349	0.992193
Sum sq. resids	14.98084	52.79392	4.759359	2.253243		S.E. equation	0.695164	1.305002	0.391826	0.269602
F-statistic	3.625145	14.14687	381.4560	620.5790		Log likelihood	-37.11540	-62.30787	-14.18221	0.772634
Akaike AIC	2.305770	3.565394	1.159111	0.411368		Schwarz SC	2.685768	3.945392	1.539108	0.791366
Mean dependded	31.12551	24.46152	25.26712	26.95533		S.D. dependent	0.862253	2.509134	3.483558	3.051308
Determinant resid covariance (dof adj.)				0.007895		Log likelihood				-109.8073
Determinant resid covariance				0.002		Akaike information criterion				7.2903

	848						63
Schwarz criterion	8.810 354						

Note: VAR Lag Order Selection Criteria is 2

Source: Author's Compilation 2025.

From the result there is a pretty intuitive reason to report that there is mixed dynamic interactive effects between inflation determinant and unemployment in Nigeria Specifically, consumers spending, government spending and interest rate have positive interactive effect on unemployment in lag one period; while government and interest rate assert negative effect on unemployment in the lag two period. Unemployment and government spending assert negative effect on consumers spending, while interest rate affected it otherwise in lag one period; while in lag two, unemployment has positive effect on consumers spending, government spending and interest rate expressed negative effect on consumers spending.

From consumers spending and interest rate, government spending received negative effect whereas unemployment effected it positively in lag one period. In the lag two period, unemployment and consumers spending assert positive effect on government spending while interest rate still maintain a negative effect on government spending. Unemployment, consumers spending and government spending affirm positive effect on interest rate in time lag one period; where consumers spending and government spending have negative effect on interest rate in lag two period within the same single model. The mixed dynamic interactive effects as reported are partly fueled by the effects of residuals from the series used in the study. To this effect, it becomes imperative to account for residual correlation matrix as reported in the table below:

Table 3.5: Result of VAR Variance Decompositionon UNE, CSP, GSP and INT

Variance Decomposition of UNE							**Variance Decomposition of CSP**					
P	**S.E**	**UNE**	**CSP**	**GSP**	**INT**		**P**	**S.E**	**UNE**	**CSP**	**GSP**	**INT**
1	0.695 164	100.0 000	0.000 000	0.000 000	0.000 000		1	1.305 002	0.004 178	99.99 582	0.000 000	0.000 000
2	0.730 674	99.84 111	0.020 590	0.126 948	0.011 351		2	1.780 384	3.164 621	96.15 314	0.281 352	0.400 891
3	0.743 776	99.01 167	0.286 830	0.577 100	0.124 397		3	2.013 693	3.085 610	96.22 899	0.277 445	0.407 956
4	0.748 672	98.70 733	0.284 838	0.724 867	0.282 964		4	2.147 562	3.330 812	96.03 283	0.254 558	0.381 796
5	0.751 655	98.32 446	0.356 291	0.858 763	0.460 488		5	2.227 259	3.926 084	95.37 808	0.337 551	0.358 284
6	0.755 350	97.81 909	0.557 696	0.954 667	0.668 549		6	2.272 548	4.570 987	94.54 766	0.537 134	0.344 215
7	0.759 051	97.18 490	0.900 275	1.003 658	0.911 163		7	2.298 985	5.257 359	93.57 060	0.835 626	0.336 414

8	0.762751	96.46197	1.330645	1.019058	1.188327		8	2.315731	5.930673	92.54536	1.192404	0.331567
9	0.766351	95.70190	1.785025	1.014595	1.498480		9	2.328337	6.542676	91.56594	1.562587	0.328799
10	0.769736	94.94817	2.208599	1.005937	1.837294		10	2.339931	7.063642	90.70034	1.905569	0.330444
TQ	**7.48318**	**978.0006**	**7.730789**	**7.285593**	**6.983013**		**TQ**	**21.02943**	**42.84664**	**946.71876**	**7.184224**	**3.220366**
Variance Decomposition of GSP								**Variance Decomposition of INT**				
P	**S.E**	**UNE**	**CSP**	**GSP**	**INT**		**P**	**S.E**	**UNE**	**CSP**	**GSP**	**INT**
1	0.391826	0.375628	10.02746	89.59691	0.000000		1	0.269602	0.362353	0.417684	3.274343	95.94562
2	0.802459	51.89530	6.937052	40.91118	0.256465		2	0.511987	45.64060	1.592711	0.999398	51.76729
3	0.986528	47.62299	15.59287	36.02116	0.762988		3	0.595628	39.58319	1.279897	0.856379	58.28053
4	1.152964	42.76071	24.25284	31.56191	1.424537		4	0.670794	35.88253	1.529984	0.887956	61.69953
5	1.303169	38.44731	31.84316	27.44033	2.269198		5	0.737173	32.39893	2.132966	1.220400	64.24770
6	1.433996	34.56312	38.17173	23.97479	3.290363		6	0.796252	29.09911	2.727383	1.843430	66.33008
7	1.546372	31.31935	43.06008	21.14282	4.477738		7	0.849990	26.18002	3.084705	2.744957	67.99032
8	1.640902	28.67125	46.59825	18.91114	5.819354		8	0.899294	23.64849	3.161557	3.903857	69.28610
9	1.718978	26.53828	48.93079	17.23572	7.295216		9	0.944974	21.49128	3.020669	5.272781	70.21527
10	1.782668	24.84007	50.21635	16.06797	8.875601		10	0.987781	19.67546	2.782644	6.788444	70.75345
TQ	**12.75986 2**	**327.0346 4**	**315.6305 8**	**322.8639 3**	**34.47146**		**TQ**	**7.263475**	**273.9619 6**	**21.7302**	**27.79194 5**	**676.5158 9**

S.E = Standard Error. UNE = Unemploymentt. CSP = consumers spending. GSP = government spending. INT = Interest rate. P = Period. TQ = Total Quarte

Source: Author's Compilation, 2025.

Table 4.6 presents the result of the variance decomposition otherwise known as forecast error variance decomposition on a single system model that contains unemployment (UNE) and consumers spending (CSD), governemt spending stocks (GSP) and interest rate (INT). Variance decomposition analysis allows partitioning of total variance in an outcome variable – UNE,

CSP, GSP or INT. Such partitioning allows identifying variable that explains a significant portion of the variation in other variables. Variance decompositions reveal the effect of one endogenous variable on other endogenous variables within a given single system of equation. From the result, about 7.48 of a forecast error in UNE can be explained by CSP, GSP and INT after ten quarters. On the other hand, 21.03 of forecast error in CSP can be explained by UNE GSP and INT; 12.76 of forecast error in GSP can be explained by UNE, CSP and INT; and 7.26 of forecast error in INT can be explained by UNE, CSP and GSP within the same single system of model. The result indicates that the amount of information each of the variables contributes to the other variables in the auto-regression are 7.48, 21.03, 12.76 and 7.26 for UNE, CSP, GSP and INT respectively. This further implies that CSP receives the highest amount of the forecast error variance of each of the variables that can be explained by exogenous shocks to the other variables as the impulses propagate the system for each period. This is followed by GSP, UNE and lastly, INT in the same single system model.

Fig. 3.1 variance decomposition Result

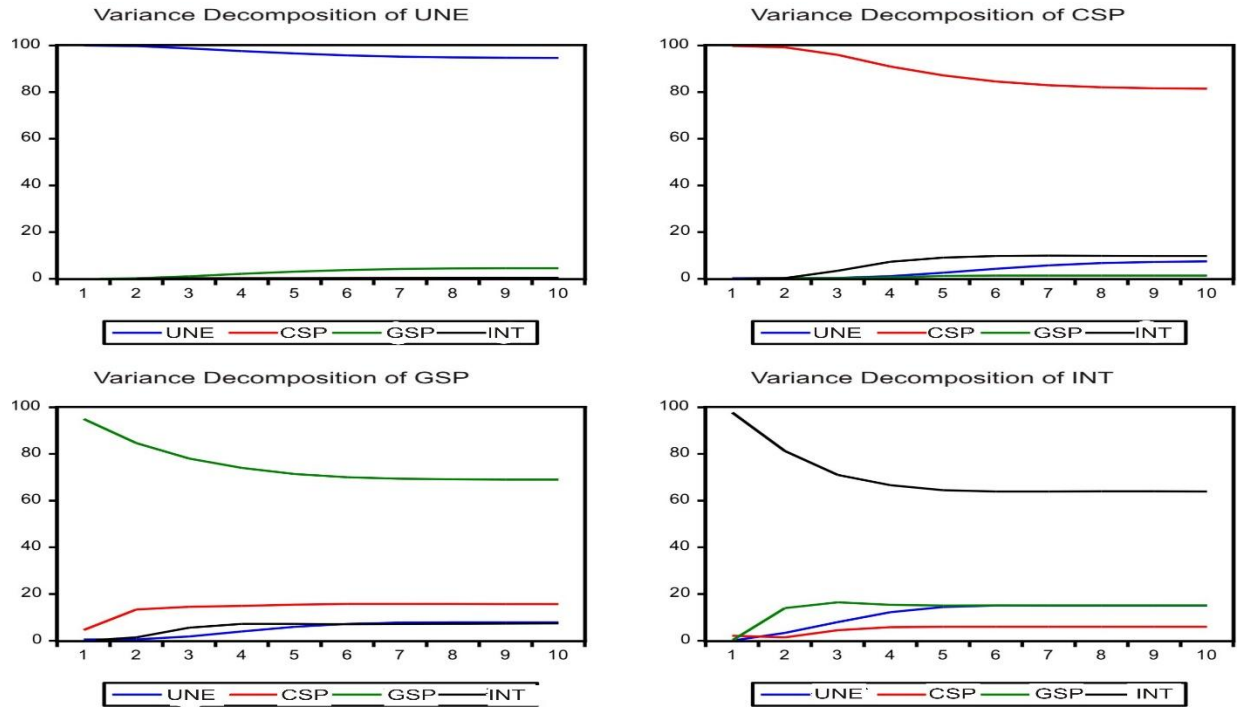


Fig 3.1 the variance decomposition otherwise known as forecast error variance decomposition on a single system model that contains unemployment (UNE) Consumers expenditure (CSP), Government Expenditure (GSP), and interest rate (INT) Variance decomposition analysis allows partitioning of total variance in an outcome, From the result, about 7.58 of a forecast error in UNE can be explained by CSP, GP and INT after ten quarters.

On the other hand, 4.31 forecast error in CSP can be explained by UNE, GPS and INT; 2.90 forecast error in GSP can be attributed to UNE, CSP and INT; and 13.84 forecast error in INT can be explained by UNE, CSP and GSP within the same single system of model.

3.6 Presentation of Results of Post Estimation Tests

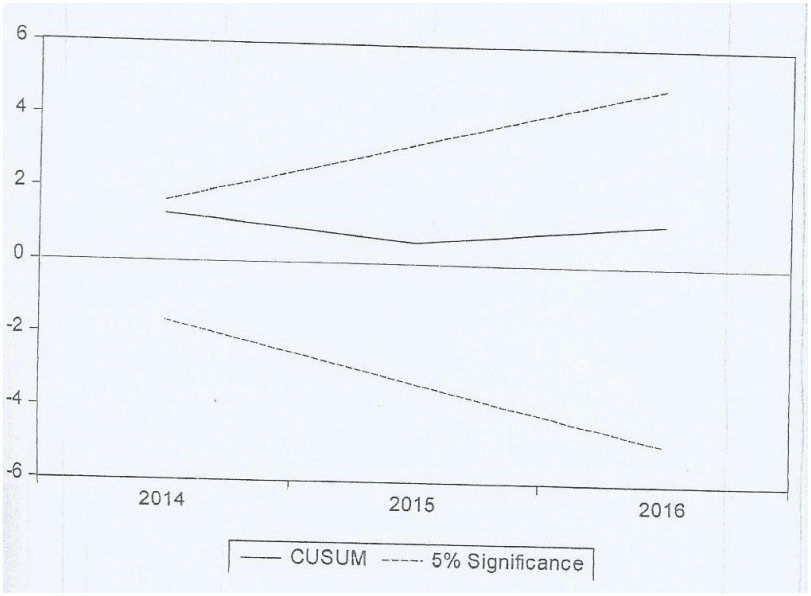
Table 3.7 Results of Post Estimation Tests

VAR Residual Normality Tests								VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)	
Component	Variable	Skewness		Kurtosis		Jarque-Bera			
		Value	Prob.	Value	Prob.	Value	Prob.	Chi-sg	Prob.
1	UNE	-3.723465	0.0000	22.51340	0.0000	727.0494	0.0000	164.3076	0.3913
2	CSP	-0.315307	0.4156	6.689552	0.0000	23.35078	0.0000		
3	GSP	0.899881	0.0202	3.716291	0.3551	6.253690	0.0439		
4	INT	0.757297	0.0505	3.534111	0.4905	4.298782	0.1166		

Source: Author's Computation, 2025

The results of post estimation test reported in table 4.4 details the VAR residual normality and VAR residual heteroskedasticity tests conducted in unemployment and inflation determinant variables such as consumers spending, government spending and interest rate. On the system model, unemployment is found to be significant given the probability values of skewness, kurtosis and Jarque-Bera because their values are less than 0.05 level of significance. For consumers spending, only kurtosis and Jarque-Bera are found to be significant while skewness does not. Government spending is found significant with respect to skewness, and Jarque-Bera, but fail to maintain the same status with kurtosis, and lastly, interest rate is found to be significant under skewness.

On the other hand, the VAR residual heteroskedasticity test reveals that probability value of the test is not significant – suggesting that the assumption of homoscedasticity is retained. These results reveal that the four variables are found to be significant at one point or another. This implies that the residual of the four variables are adjudged to be normally distributed; and as such their stochastic disturbance is evenly distributed and would not have and significant effect on the study variables as well as the result of the study. The result of the CUSUM test reveals the stability of the model



Fig, 3.3: CUSUM Test Result of Stability of the Model

Conclusion, and Recommendations

Conclusion

From consumers spending and interest rate, government spending received negative effect whereas unemployment effected it positively in lag one period. In the lag two period, unemployment and consumers spending assert positive effect on government spending while interest rate still maintain a negative effect on government spending. Unemployment, consumers spending and government spending affirm positive effect on interest rate in time lag one period; where consumers spending and government spending have negative effect on interest rate in lag two period within the same single model. The mixed dynamic interactive effects as reported are partly fueled by the effects of residuals from the series used in the study. To this effect, it becomes imperative to account for residual correlation matrix as reported in the table below:

5.3 Recommendations

The study made the following recommendation increase consumer spending georeogates to boast production and reduce unemployment

- Increase government spending capital and current spending to create more employment opportunities and hence reduce unemployment.

Since intense rate has negative dynamic interaction on unemployment, financial authorities should regulate interest rate by lowering the rate to enhance credit access and hence investment to reduce unemployment.

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