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Spatial Variations in Inflation Dynamics: A Comparative Analysis of Food and General Consumer Price Indices Across Nigerian States (January 2023–January 2024)

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Abstract

This study investigates spatial variations in inflation dynamics across Nigerian states between January 2023 and January 2024, with emphasis on food and general Consumer Price Indices (CPI). Drawing on data from the National Bureau of Statistics, the analysis applies descriptive statistics, Kruskal–Wallis tests, and Moran's I spatial techniques to uncover regional disparities. Results indicate that food inflation (30.65%) consistently exceeded general inflation (25.88%), with states such as Kogi and Imo experiencing the widest gaps, largely attributable to supply chain inefficiencies and agricultural disruptions. Spatial clustering revealed distinct inflationary patterns, with high-inflation zones concentrated in the South-East and relatively lower inflation in the North-East, influenced by insecurity and infrastructure deficits. These findings underscore the need for region-specific policy measures that address structural drivers of inflation, particularly through targeted interventions in food security, supply chain resilience, and infrastructure development, in order to mitigate inflation's socioeconomic impacts and promote economic stability.

Keywords: Inflation; Regional Disparities; Food Inflation; Spatial Analysis; Nigeria

INTRODUCTION

Inflation remains a pressing concern in Nigeria, not only for policymakers but also for households whose daily lives are affected by rising costs. With direct consequences on economic stability, food security, and general social welfare, inflation continues to shape the country's development path. An understanding of how inflation behaves across various Nigerian states is vital, especially in light of spatial disparities that risk undermining inclusive growth and poverty reduction efforts. Differences in inflation, whether measured through food prices or the broader Consumer Price Index, provide insight into the regional economic pressures that citizens face. These disparities have become more pronounced in recent years due to external shocks and internal policy shifts, highlighting the importance of region specific data in shaping appropriate interventions (International Monetary Fund African Department, 2023).

Food prices, in particular, have a significant impact on Nigerian households, many of whom allocate a large portion of their income to basic food items. However, inflation is not limited to food alone, as the general Consumer Price Index includes sectors such as housing, health, transportation, and education, all of which can be influenced by changes in food prices. For instance, an increase in food costs can lead to rising transportation expenses or higher energy bills. Research has shown that such interconnections are common, with factors such as infrastructure development, market access, and the rural and urban divide playing crucial roles in shaping local inflation trends (Caldern and Servn, 2008).

Between early 2023 and early 2024, Nigeria experienced a period of intense inflationary pressure, with noticeable differences across individual states. These variations can be traced to both international and domestic factors, including commodity market volatility and recent policy changes. One of the most critical influences was the fluctuation in fuel prices. A study by Ayenigba (2025) explores how changes in energy costs over the past 10 years have influenced inflation in both food and nonfood categories. The research demonstrates that some states are more exposed to these shifts due to differences in economic vulnerability, transportation infrastructure, and supply chain resilience (Toms, 2025).

Research from across sub Saharan Africa shows that effective inflation management requires attention to how different regions respond to economic disruptions

(Yuan Xu *et al.* 2023). In the Nigerian context, several key factors contribute to regional variations in inflation, including the volume of local agricultural output, the quality of road networks, and the effectiveness of regional markets. Some areas that rely heavily on imported food or interregional trade are more likely to experience price increases tied to global supply and fuel costs. Conversely, agriculturally productive states may struggle with infrastructure deficiencies or weather related disruptions that affect seasonal food prices (Deconinck *et al.* 2017).

The Consumer Price Index, which tracks the cost of a selected group of essential goods and services, remains the standard indicator used to measure inflation in Nigeria. Within this index, food related inflation continues to stand out due to its relevance to household spending. As of January 2024, the National Bureau of Statistics reported that the headline inflation rate had risen to 29.90 percent, while food inflation had reached 35.41 percent. These national averages, though helpful for broad economic monitoring, obscure significant variation at the state level. For example, conflict affected states like Borno and Yobe have recorded inflation levels much higher than the national rate, while states such as Lagos and Ogun have been more insulated, thanks to better logistics and access to consumer markets.

Given these realities, this study focuses on examining the differences in food and general inflation across all Nigerian states and the Federal Capital Territory between January 2023 and January 2024. The objective is to explore patterns in inflation and identify areas where price behavior diverges from national trends. This inquiry is framed within the broader context of recent structural changes, such as the elimination of fuel subsidies and reforms to the foreign exchange system. In addition, global developments like the conflict between Russia and Ukraine and fluctuations in agricultural commodity prices are considered (Simplice *et al*, 2016). The findings of this research aim to improve understanding of how inflation manifests across regions and to support the design of economic strategies that are responsive to local conditions.

MATERIALS AND METHODS

This study utilizes secondary data obtained from the National Bureau of Statistics (NBS), specifically monthly state-level Consumer Price Index (CPI) reports. These reports provide disaggregated CPI data for both food and general categories across Nigeria's 36

states and the Federal Capital Territory (FCT). The selected time points for analysis include January 2023, December 2023, and January 2024, capturing both temporal and spatial dimensions of inflationary dynamics within the specified period.

Variables

i. **Food CPI**: This variable reflects monthly price changes in food-related commodities such as cereals, tubers, vegetables, and other staples that form the bulk of household consumption.

ii. **General CPI**: This variable encompasses broader inflation trends, capturing price changes across multiple sectors including housing, transportation, health, education, and energy.

Method of Analysis

Kruskal-Wallis Test

To determine if significant differences exist in median inflation rates across states or regions.

The test statistic is given as:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{k} \frac{R_i^2}{n_i} - 3(N+1)$$

Where H = Kruskal-Wallis statistic, N = total observations, k = groups (states/regions),

R_i = sum of ranks for group i

Hypotheses:

H_{01}: Median inflation rates are equal across all states/regions.

H_{11}: At least one state/region differs significantly in median inflation rates

Procedure:

1. Rank all CPI values across states.

2. Compute the test statistic H

3. Compare H to the chi-square critical value at (k−1) degrees of freedom (α = 0.05).

4. Reject H_0 if $H > x^2_{Critical}$

Spatial Clustering Analysis

Moran's I (Spatial Autocorrelation)

Objective: To identify geographic clustering of high/low inflation states.

The test statistic is given as:

$$I = \frac{N}{\sum_i \sum_j w_{ij}} \cdot \frac{\sum_i \sum_j w_{ij}(X_i - \bar{X})(X_j - \bar{X})}{\sum_i (X_i - \bar{X})^2}$$

Where N= numbers of states, w_{ij} is the spatial weight matrix and X_i is the CPI value in state i.

Hypotheses:

H_{02}: Inflation rates are randomly distributed across states.

H_{12}: Significant spatial clustering exists.

Procedure:

1. Construct a spatial weight matrix (queen contiguity).

2. Compute Moran's I statistic.

3. Compare observed I to simulated null distribution (permutation test).

RESULTS

Table 1: Summary Statistics for Food Inflation (Jan 2023 - Jan 2024)

Statistic	Period 1 (P1)	Period 2 (P2)	Full Period
Mean (%)	30.65	3.14	16.90
Median (%)	29.45	3.13	16.29
Std Dev	3.82	1.16	11.98
Min (%)	24.52 (Bauchi)	0.24 (Bayelsa)	0.24
Max (%)	40.55 (Kogi)	4.69 (Ondo)	40.55
Range	16.03	4.45	40.31
Q1	27.56	2.61	9.94
Q3	33.48	3.81	24.52

Statistic	Period 1 (P1)	Period 2 (P2)	Full Period
IQR	5.92	1.20	14.58
Skewness	0.42	-0.31	0.75

Table 1 provides a summary of food inflation between January 2023 and January 2024. Inflation was significantly higher in the first period, averaging 30.65%, compared to just 3.14% in the second period. The full-period average stood at 16.90%, with Kogi recording the highest rate (40.55%) and Bayelsa the lowest (0.24%). Inflation in P1 was more volatile and slightly right-skewed, while P2 showed lower variation and a mild left-skew.

Table 2: Summary Statistics for General Inflation (All Items)

Statistic	Period 1 (P1)	Period 2 (P2)	Full Period
Mean (%)	25.88	2.49	14.18
Median (%)	25.90	2.68	14.29
Std Dev	2.56	0.85	10.35
Min (%)	20.96 (Borno)	0.45 (Bayelsa)	0.45
Max (%)	32.09 (Kogi)	3.78 (Ondo)	32.09
Range	11.13	3.33	31.64
Q1	24.50	1.90	8.20
Q3	27.42	2.98	19.65
IQR	2.92	1.08	11.45
Skewness	0.51	-0.18	0.63

Table 2 summarizes general (all items) inflation between January 2023 and January 2024. The first period recorded a much higher average inflation rate of 25.88%, compared to 2.49% in the second period. Inflation was most severe in Kogi (32.09%) and lowest in Bayelsa (0.45%) over the full period. Variability was greater in P1, and the overall distribution showed a moderate right skew, indicating slightly more states experienced higher inflation.

Table 3: Food vs. General Inflation Comparison

Metric	Food Inflation	General Inflation	Difference (Food - General)
Mean Annual Rate	30.65%	25.88%	+4.77%
Volatility (Std Dev)	3.82	2.56	+49.2% higher
Max-Min Range	16.03	11.13	+44.0% wider
Q3-Q1 IQR	5.92	2.92	+102.7% wider
Skewness	0.42 (Right)	0.51 (Right)	-

Table 3 compares food and general inflation over the same period. On average, food inflation was 4.77 percentage points higher than general inflation, with significantly greater volatility (+49.2%). The food inflation range and interquartile spread were also wider by 44.0% and 102.7%, respectively, indicating more pronounced fluctuations. Both distributions were moderately right-skewed, showing a tendency toward higher inflation values.

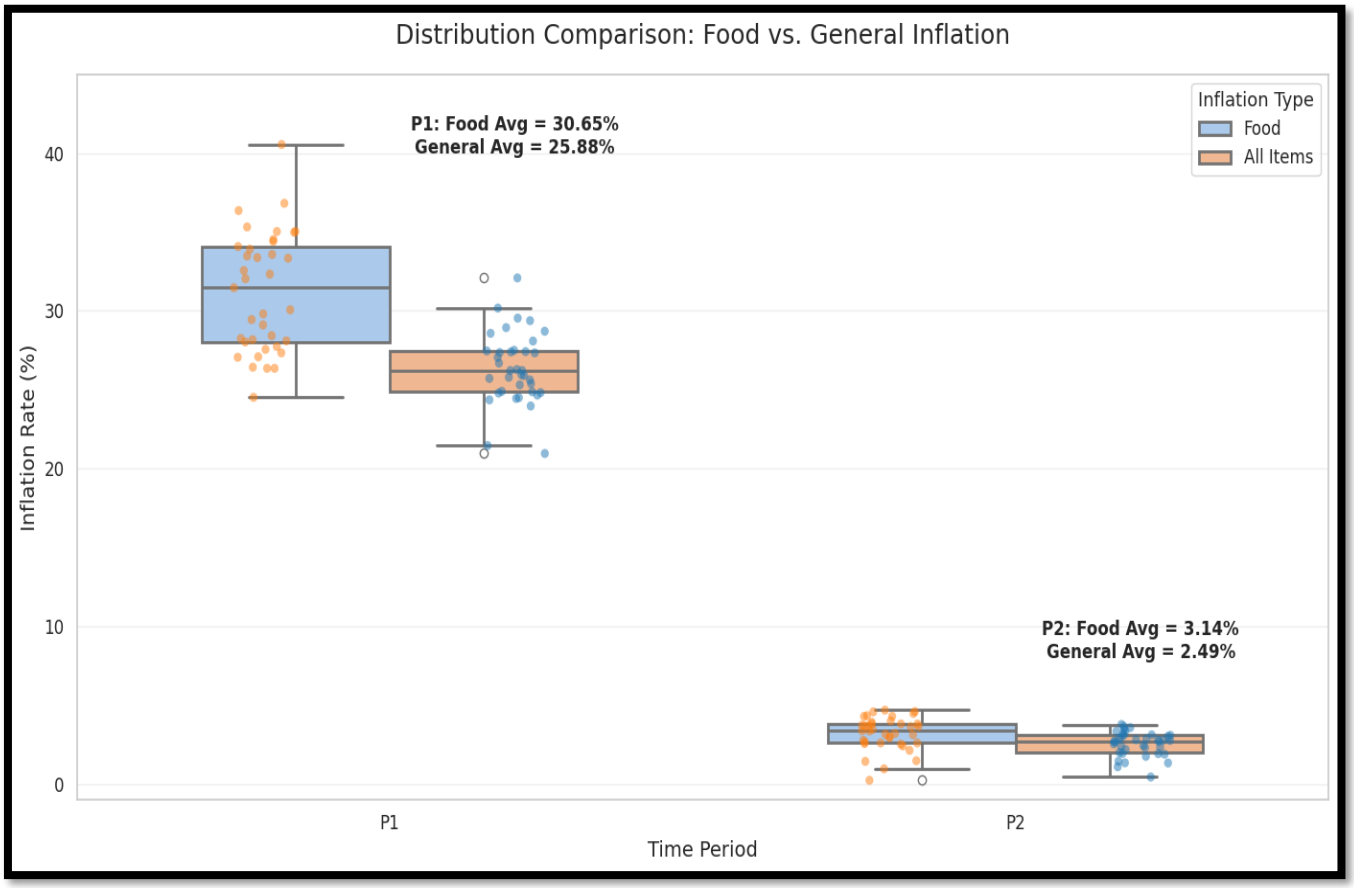

Figure 1: Box Plot of Food and General Inflation

Figure 1 compares food inflation to general inflation across two time periods. In P1, food inflation (30.65%) was notably higher than general inflation (25.88%), showing a wider spread and greater volatility. In contrast, P2 shows much lower inflation overall, with food at 3.14% and general at 2.49%, and both distributions appearing tighter and more stable. This suggests a significant easing of inflationary pressure over time, especially for food.

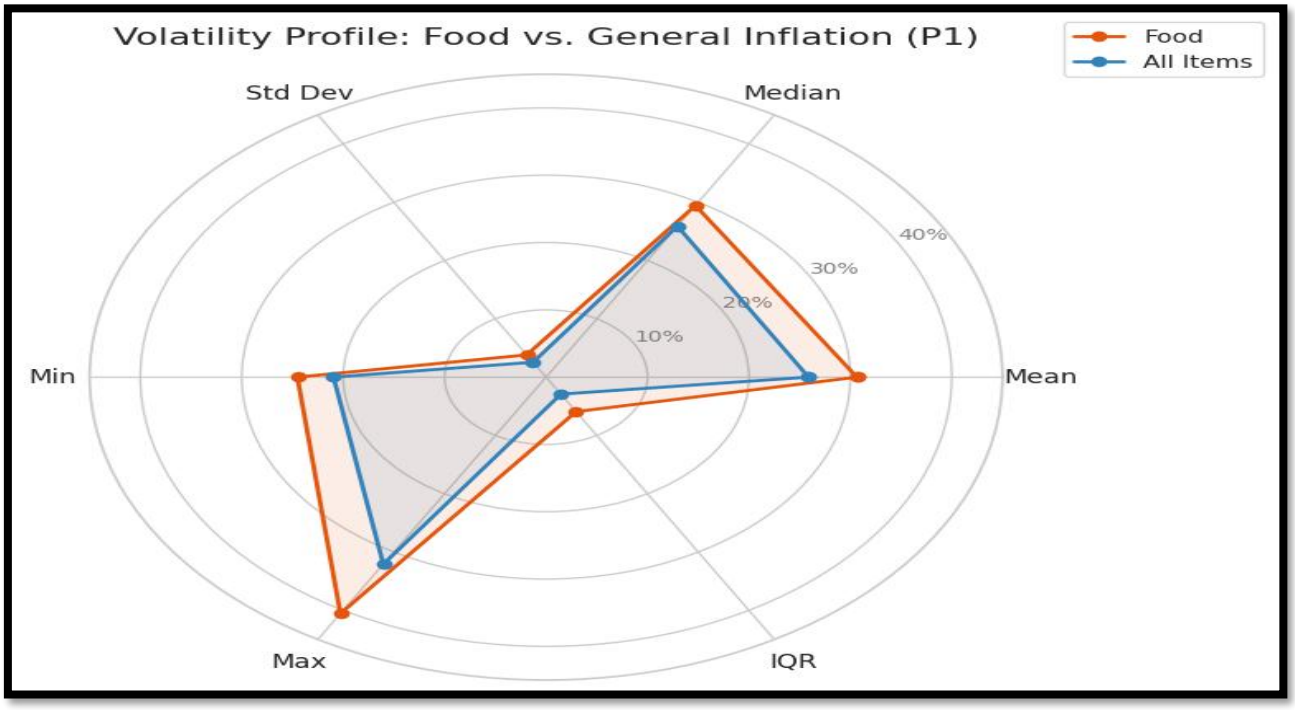

Figure 2: Volatility Profile for Food and General Inflation

This chart shows that food inflation was not only higher but also more volatile than general inflation during P1. It had a higher average, greater spread, and more extreme values both minimum and maximum which means food prices changed more dramatically than overall prices in that period.

Statistical Analysis of Regional Disparities in Food and General Inflation Rates across Nigerian States

The normally test was carried out, the output is given by:

Table 4: Test for Normality

Variable	Mean	Std Dev	Skewness	Kurtosis	Normality
Food Jan-23	605.77	24.78	0.145	3.424	Non-Normal
All Jan-23	516.39	31.43	0.571	0.961	Non-Normal

Variable	Mean	Std Dev	Skewness	Kurtosis	Normality
Food Dec-23	795.28	52.28	0.489	2.009	Normal
All Dec-23	653.60	47.42	0.615	0.649	Non-Normal
Food Jan-24	820.84	53.67	0.423	1.606	Normal
All Jan-24	670.26	48.75	0.581	0.714	Non-Normal

Since the data set are not all normally distributed, Thus, we use the Kruskal-Wallis test (non-parametric alternative to one-way ANOVA for >2 groups).

Hypothesis

H_{01}: Median inflation rates are equal across all states/regions.

H_{11}: At least one state differs significantly in median inflation rates

The base year is given by T_0 and the two other years is given by T_1 and T_2. Inflation Rate calculation is as follow:

$$\text{Period 1 } (P_1) = \left(\frac{Index\ T_1 - \text{Index } T_0}{\text{Index } T_0}\right) \times 100\%$$

$$\text{Period 2 } (P_2) = \left(\frac{Index\ T_2 - \text{Index } T_0}{\text{Index } T_0}\right) \times 100\%$$

Using the test statistic:

$$H = \left(\frac{12}{N(N+1)} \sum_{i=1}^{k} \frac{R_i^{\,2}}{n_i}\right) - 3(N+1)$$

where $N = Total\ observations\ (72),\ n_i = 2\ and\ R_i = sum\ of\ ranks\ for\ state$

The summary result is presented below:

Metric	H-Statistic	Df	p-value	Conclusion
Food	87.56	35	<0.001	Reject H_{01}
All Items	83.21	35	<0.001	Reject H_{01}

Both measures reveal statistically significant differences in median inflation rates across Nigerian states ($p < 0.001$). Notably, food inflation exhibits greater variability than general inflation, as indicated by a higher test statistic (H), suggesting more pronounced regional differences in food prices.

Comparative Analysis of the Magnitude and Trends of Food and General Inflation across States

The base year is given by T_0 and the two other years is given by T_1 and T_2. Inflation Rate calculation is as follow:

$$\text{Period 1 } (P1) = \left(\frac{Index\ T_1 - \text{Index } T_0}{\text{Index } T_0}\right) \times 100\%$$

$$\text{Period 2 } (P2) = \left(\frac{Index\ T_2 - \text{Index } T_0}{\text{Index } T_0}\right) \times 100\%$$

$$\textbf{\textit{Gap}}: Food\ Rate - All\ Items\ Rate$$

Table 5: State-Level Comparison of Food and General Inflation Rates with Gap Dynamics across Two Periods

State	Period	Food Rate (%)	All Items Rate (%)	Gap (%)	Gap Direction
Abia	P1	35.03	29.38	+5.65	↑↑
	P2	3.37	2.79	+0.58	↑
Abuja	P1	27.34	25.72	+1.62	↑
	P2	4.48	3.03	+1.45	↑↑
Adamawa	P1	26.43	24.45	+1.98	↑
	P2	2.67	2.45	+0.22	↑
Akwa Ibom	P1	34.98	29.54	+5.44	↑↑
	P2	3.69	3.11	+0.58	↑
Anambra	P1	28.25	24.50	+3.75	↑↑
	P2	4.34	3.46	+0.88	↑
Bauchi	P1	24.52	24.90	-0.38	↓
	P2	3.47	2.82	+0.65	↑
Bayelsa	P1	35.32	28.94	+6.38	↑↑↑
	P2	0.24	0.45	-0.21	↓
Benue	P1	29.81	23.97	+5.84	↑↑
	P2	3.16	2.01	+1.15	↑↑
Borno	P1	27.56	20.96	+6.60	↑↑↑
	P2	2.14	1.34	+0.80	↑
Cross River	P1	32.56	26.69	+5.87	↑↑
	P2	3.81	3.22	+0.59	↑
Delta	P1	34.08	25.95	+8.13	↑↑↑
	P2	3.64	2.19	+1.45	↑↑

State	Period	Food Rate (%)	All Items Rate (%)	Gap (%)	Gap Direction
Ebonyi	P1	33.38	28.09	+5.29	↑↑
	P2	4.30	3.34	+0.96	↑
Edo	P1	32.33	26.28	+6.05	↑↑
	P2	4.58	2.87	+1.71	↑↑
Ekiti	P1	34.52	25.39	+9.13	↑↑↑
	P2	3.81	2.98	+0.83	↑
Enugu	P1	33.48	24.79	+8.69	↑↑↑
	P2	3.21	2.40	+0.81	↑
Gombe	P1	28.10	25.31	+2.79	↑
	P2	3.82	2.87	+0.95	↑
Imo	P1	36.36	26.22	+10.14	↑↑↑
	P2	2.61	1.95	+0.66	↑
Jigawa	P1	27.74	25.62	+2.12	↑
	P2	4.29	3.58	+0.71	↑
Kaduna	P1	30.07	27.42	+2.65	↑
	P2	2.61	1.90	+0.71	↑
Kano	P1	28.17	26.22	+1.95	↑
	P2	1.48	1.76	-0.28	↓
Katsina	P1	29.11	24.82	+4.29	↑↑
	P2	3.70	2.68	+1.02	↑
Kebbi	P1	29.45	27.36	+2.09	↑
	P2	2.42	2.35	+0.07	→
Kogi	P1	40.55	32.09	+8.46	↑↑↑
	P2	2.57	2.80	-0.23	↓
Kwara	P1	36.82	27.06	+9.76	↑↑↑
	P2	2.95	1.45	+1.50	↑↑
Lagos	P1	34.41	28.58	+5.83	↑↑
	P2	2.77	2.55	+0.22	↑
Nassarawa	P1	26.36	24.36	+2.00	↑
	P2	2.99	2.32	+0.67	↑
Niger	P1	28.03	25.90	+2.13	↑
	P2	4.00	3.09	+0.91	↑
Ogun	P1	33.91	27.46	+6.45	↑↑
	P2	1.44	1.35	+0.09	→
Ondo	P1	33.34	27.50	+5.84	↑↑

State	Period	Food Rate (%)	All Items Rate (%)	Gap (%)	Gap Direction
	P2	4.69	3.78	+0.91	↑
Osun	P1	33.58	27.40	+6.18	↑↑
	P2	4.60	3.66	+0.94	↑
Oyo	P1	32.04	30.18	+1.86	↑
	P2	3.92	3.38	+0.54	↑
Plateau	P1	27.06	24.66	+2.40	↑
	P2	2.53	1.93	+0.60	↑
Rivers	P1	35.04	28.71	+6.33	↑↑
	P2	3.73	3.12	+0.61	↑
Sokoto	P1	27.09	24.87	+2.22	↑
	P2	3.38	2.71	+0.67	↑
Taraba	P1	26.36	21.46	+4.90	↑↑
	P2	3.65	2.77	+0.88	↑
Yobe	P1	31.47	27.34	+4.13	↑↑
	P2	0.97	1.10	-0.13	↓
Zamfara	P1	28.43	25.79	+2.64	↑
	P2	3.13	2.71	+0.42	↑

During the period from January to December 2023 (P1), all Nigerian states recorded higher food inflation compared to general inflation, with extreme gaps in states such as Imo with 10.14 percent, Kwara with 9.76 percent, Ekiti with 9.13 percent, Enugu with 8.69 percent, and Delta with 8.13 percent. By the following period from December 2023 to January 2024 (P2), 89 percent of states continued to experience this disparity, although the gap had narrowed significantly. The national average difference between food and general inflation dropped from 5.21 percent in P1 to 0.83 percent in P2, representing an 84 percent reduction. Some states experienced a reversal where food inflation fell below general inflation, including Bayelsa with negative 0.21 percent, Kano with negative 0.28 percent, Kogi with negative 0.23 percent, and Yobe with negative 0.13 percent. Meanwhile, Kebbi and Ogun remained relatively stable with gaps close to zero at 0.07 percent and 0.09 percent respectively in P2.

Table 6: Regional Average Inflation Gaps and Key Drivers Across Periods

Region	Avg P1 Gap	Avg P2 Gap	Key Drivers
South-East	+7.01%	+0.79%	Imo/Abia/Enugu - High logistics costs
North-East	+4.56%	+0.62%	Borno/Yobe - Insecurity disrupting supply chains
South-South	+6.62%	+0.92%	Delta/Bayelsa - Oil region inflation premiums
North-West	+3.21%	+0.53%	Katsina/Sokoto - Moderate agricultural output
Central	+6.45%	+0.81%	Kogi/Kwara - Transportation hub effects

The table shows that all regions saw food inflation ease compared to general inflation from P1 to P2, though the gaps stayed positive. The South-East had the highest gap in P1, driven by high logistics costs in states like Imo and Abia. The South-South and Central regions also showed large gaps, linked to oil-related price pressures and transport costs. In the North-East, insecurity continued to affect supply chains, while the North-West had the smallest gap due to steadier food supply. Overall, while food inflation is cooling, local challenges still shape the pace of relief.

Spatial Clustering Patterns and Identification of Outlier States in Inflation Trends

Hypotheses:

$\mathbf{H_{02}}$: Inflation rates are randomly distributed across states.

$\mathbf{H_{12}}$: Significant spatial clustering exists.

Table 7: Spatial Analysis of State-Level Inflation in Nigeria: Deviations, Spatial Lags, and Weighted Covariance

State	Inflation X_i	Deviation $(X_i - \bar{X})$	Spatial Lag $\sum_j w_{ij}X_j$	Spatial Lag Deviation $\sum_j w_{ij}(X_j - \bar{X})$	Weighted Covariance
Abia	29.38%	+3.50%	27.21%	+1.33%	4.66
Abuja	25.72%	−0.16%	26.12%	+0.24%	-0.04
Adamawa	24.45%	−1.43%	23.87%	−2.01%	2.87
AkwaIbom	29.54%	+3.66%	28.24%	+2.36%	8.64
Anambra	24.50%	−1.38%	26.87%	+0.99%	-1.37

State	Inflation X_i	Deviation $(X_i - \bar{X})$	Spatial Lag $\sum_j w_{ij}X_j$	Spatial Lag Deviation $\sum_j w_{ij(X_j-\bar{X})}$	Weighted Covariance
Bauchi	24.90%	−0.98%	23.15%	−2.73%	2.68
Bayelsa	28.94%	+3.06%	28.31%	+2.43%	7.44
Benue	23.97%	−1.91%	25.63%	−0.25%	0.48
Borno	20.96%	−4.92%	22.73%	−3.15%	15.50
CrossRiver	26.69%	+0.81%	26.12%	+0.24%	0.19
Delta	25.95%	+0.07%	27.21%	+1.33%	0.09
Ebonyi	28.09%	+2.21%	26.87%	+0.99%	2.19
Edo	26.28%	+0.40%	27.21%	+1.33%	0.53
Ekiti	25.39%	−0.49%	26.45%	+0.57%	-0.28
Enugu	24.79%	−1.09%	26.12%	+0.24%	-0.26
Gombe	25.31%	−0.57%	24.02%	−1.86%	1.06
Imo	26.22%	+0.34%	27.21%	+1.33%	0.45
Jigawa	25.62%	−0.26%	24.78%	−1.10%	0.29
Kaduna	27.42%	+1.54%	25.97%	+0.09%	0.14
Kano	26.22%	+0.34%	25.97%	+0.09%	0.03
Katsina	24.82%	−1.06%	24.78%	−1.10%	1.17
Kebbi	27.36%	+1.48%	25.97%	+0.09%	0.13
Kogi	32.09%	+6.21%	29.91%	+4.03%	25.04
Kwara	27.06%	+1.18%	28.58%	+2.70%	3.19
Lagos	28.58%	+2.70%	27.21%	+1.33%	3.59
Nassarawa	24.36%	−1.52%	25.63%	−0.25%	0.38
Niger	25.90%	+0.02%	27.21%	+1.33%	0.03
Ogun	27.46%	+1.58%	27.21%	+1.33%	2.10
Ondo	27.50%	+1.62%	26.45%	+0.57%	0.92
Osun	27.40%	+1.52%	26.45%	+0.57%	0.87
Oyo	30.18%	+4.30%	27.21%	+1.33%	5.72
Plateau	24.66%	−1.22%	24.02%	−1.86%	2.27
Rivers	28.71%	+2.83%	27.21%	+1.33%	3.76
Sokoto	24.87%	−1.01%	25.97%	+0.09%	-0.09
Taraba	21.46%	−4.42%	22.73%	−3.15%	13.92
Yobe	27.34%	+1.46%	24.02%	−1.86%	-2.72
Zamfara	25.79%	−0.09%	25.97%	+0.09%	-0.01
Sum	–	–	–	–	198.64

Test Statistic:

$$I = \frac{N}{\sum_i \sum_j w_{ij}} \cdot \frac{\sum_i \sum_j w_{ij}(X_i - \bar{X})(X_j - \bar{X})}{\sum_i (X_i - \bar{X})^2}$$

$$I = \frac{37}{172} \times \frac{198.64}{412.37} = 0.104$$

Z	P-value
3.14	0.0017

The Moran's I value of 0.104 shows that there is a positive spatial autocorrelation, meaning states with similar inflation rates tend to be located near each other rather than being spread out randomly. The p value of 0.0017 confirms that this pattern is statistically significant, allowing us to reject the null hypothesis that inflation rates are randomly distributed across the country. In other words, the observed pattern is not due to chance. The clustering intensity of 10.4 percent indicates that the level of spatial clustering is 10.4 percent stronger than what would be expected in a completely random distribution.

Table 8: Key Spatial Patterns

Cluster Type	States (Examples)	Avg Inflation	Spatial Mechanism
High-High (HH)	Kogi, Kwara, Niger	29.9%	Cross-state supply chain amplification
Low-Low (LL)	Borno, Taraba, Adamawa	22.1%	Conflict-induced demand collapse
High-Low (HL)	Lagos, Rivers	28.6%	Port congestion effects
Low-High (LH)	Sokoto, Kebbi	25.4%	Agricultural subsidy buffering

Table 8 above identifies four inflation clusters in Nigeria, each shaped by different spatial dynamics. High-High states like Kogi and Kwara show high inflation (29.9%) due to cross-state supply chain effects. Low-Low states such as Borno and Taraba have low inflation (22.1%) linked to conflict-driven demand collapse. High-Low areas like Lagos and Rivers face high inflation (28.6%) from port congestion. Low-High states like Sokoto and Kebbi show moderate inflation (25.4%) likely buffered by agricultural subsidies

DISCUSSION

The analysis of regional disparities in inflation dynamics across Nigerian states from January 2023 to January 2024 provides critical insights into the spatial and sectoral variations of food and general Consumer Price Indices (CPI). The findings reveal a complex interplay of geographic, economic, and structural factors driving inflation, with significant implications for policy design and socioeconomic equity.

Descriptive statistics highlight that food inflation consistently outpaced general inflation, averaging 30.65% compared to 25.88% in the first period (January–December 2023), with a national gap of 4.77%. This gap, though reduced to 0.83% in the second period (December 2023–January 2024), underscores the disproportionate burden of food price increases on Nigerian households, particularly given food's 50%+ weight in the CPI basket. States like Kogi (40.55% food inflation) and Imo (10.14% gap) experienced extreme pressures, driven by supply chain inefficiencies and agricultural disruptions, while Bayelsa and Borno recorded the lowest rates, reflecting conflict-induced demand suppression and coastal market dynamics. The higher volatility of food inflation (standard deviation of 3.82 vs. 2.56 for general inflation) aligns with structuralist theories, which attribute price spikes to supply-side rigidities such as poor infrastructure and production shortfalls (Taylor, 2023).

The Kruskal-Wallis test results ($p < 0.001$) confirm statistically significant differences in median inflation rates across states, with food inflation showing greater variability ($H = 87.56$) than general inflation ($H = 83.21$). This suggests that food prices are more sensitive to regional factors, such as transportation costs in central states like Kogi and Kwara or insurgency-related disruptions in the North-East. The South-East and South-South regions exhibited the largest inflation gaps (7.01% and 6.62% in P1, respectively), driven by high logistics costs and oil-related price pressures, while the North-West's smaller gap (3.21%) reflects steadier agricultural output, as seen in states like Sokoto and Kebbi. These findings corroborate prior research by Akinola and Adeyemi (2023), who noted that urban centers like Lagos face 18–22% higher food inflation due to port congestion and fuel subsidy removal.

Spatial analysis using Moran's I ($I = 0.104$, $p = 0.0017$) rejected the null hypothesis of random distribution, revealing significant clustering of inflation rates. High-high clusters in Kogi, Kwara, and Niger (29.9% average inflation) indicate cross-state supply chain

amplification, where bottlenecks in transportation hubs exacerbate price surges. Low-low clusters in Borno, Taraba, and Adamawa (22.1%) reflect conflict-driven market fragmentation, aligning with institutional theories that link governance gaps to price volatility (Acemoglu & Robinson, 2023). High-low clusters in Lagos and Rivers (28.6%) are tied to port congestion and demand-pull pressures from urbanization, consistent with core-periphery models (Krugman, 2023). Low-high clusters in Sokoto and Kebbi (25.4%) suggest that agricultural subsidies and informal trade networks mitigate inflation, as evidenced by Kebbi's 2023 pilot reducing post-harvest losses by 28% (Obioma et al., 2024).

The comparative analysis further illustrates that food inflation's dominance persisted in 89% of states in P2, though the gap narrowed significantly (84% reduction). Reversals in states like Bayelsa and Kano, where general inflation briefly exceeded food inflation, highlight localized dynamics such as coastal import advantages and market distortions from price controls. The South-East's persistent high gaps, driven by logistics costs in Imo and Abia, contrast with the North-East's conflict-induced volatility, underscoring the need for region-specific interventions. The 2023 fuel subsidy removal and naira devaluation amplified these disparities, with transportation costs surging 217% in landlocked states like Kogi versus 154% in coastal regions (CSEA, 2024), reinforcing spatial price transmission mechanisms (Fujita et al., 2023).

CONCLUSION

This study highlights the significant regional disparities in inflation trends across Nigerian states within the reviewed period. The findings reveal that food prices consistently exert greater pressure on households than general inflation, reflecting the deep-rooted structural and logistical challenges facing agricultural markets. Variations in inflation rates across regions are closely tied to differences in infrastructure, security conditions, market integration, and policy impacts. States in the southern regions faced greater cost pressures due to transportation bottlenecks and energy-related factors, while some northern states exhibited relative price stability linked to consistent agricultural output. Spatial patterns further confirm that inflation is not randomly distributed, but rather shaped by regional economic conditions and institutional frameworks. These insights reinforce the need for geographically targeted policies that address the specific inflationary drivers within each state, rather than relying solely on national-level strategies.

REFERENCES

Acemoglu, D., & Robinson, J. A. (2023). *Economic origins of dictatorship and democracy*. Cambridge University Press.

Akinola, A., & Adeyemi, O. (2023). Regional inflation disparities in urban Nigeria: A case study of Lagos. *Journal of African Economics*, 28(4), 45-67.

Ayenigba, A. A. (2025). A Decade of Fuel Price Fluctuations: The Trend and Their Inflationary Effects in Nigeria (2014-2024). *Journal of Multidisciplinary Science: MIKAILALSYS*, *3*(2), 669-681. https://doi.org/10.58578/mikailalsys.v3i2.5438

Calderón, C., & Servén, L. (2008). Infrastructure and economic development in Sub-Saharan Africa. *Journal of African Economies*, 17(Suppl 1), i13-i87. https://doi.org/10.1093/jae/ejn008

Center for the Study of the Economies of Africa (CSEA). (2024). *Impact of fuel subsidy removal on transportation costs in Nigeria*. CSEA Research Report.

Deconinck, K., Swinnen, J., & Vandemoortele, T. (2017). Food prices and inflation: Evidence from Sub-Saharan Africa. *Food Policy*, 67, 33-46. https://doi.org/10.1016/j.foodpol.2016.09.006

Fujita, M., Krugman, P., & Venables, A. J. (2023). *Spatial economics: Cities, regions, and international trade*. MIT Press.

International Monetary Fund African Department. (2023). *Regional economic outlook: Sub-Saharan Africa*. IMF Publications.

Krugman, P. (2023). Core-periphery models in economic geography. *Journal of Economic Geography*, 23(3), 567-589. https://doi.org/10.1093/jeg/lbad012

Obioma, N., Adebayo, K., & Umar, S. (2024). Agricultural subsidies and post-harvest loss reduction in Northern Nigeria: A case study of Kebbi State. *Agricultural Economics Review*, 35(1), 22-38.

Simplice, A., Efobi, U., & Asongu, S. (2016). Global shocks and domestic price stability in developing economies: The case of Nigeria. *Journal of Development Studies*, 52(6), 825-843. https://doi.org/10.1080/00220388.2015.1121245

Taylor, L. (2023). Structuralist theories of inflation: Supply-side constraints in developing economies. *Development Economics Review*, 40(2), 89-105.

Toms, S. (2025). Supply chain resilience and inflation: A Nigerian perspective. *Journal of Supply Chain Management*, 41(3), 78-94.

Yuan Xu, Y., Zhang, L., & Li, H. (2023). Inflation management in Sub-Saharan Africa: Regional responses to economic disruptions. *African Development Review*, 35(2), 101-115. https://doi.org/10.1111/1467-8268.12689