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TIME SERIES ANALYSIS OF QUARTERLY INFLATIONARY RATE IN NIGERIA

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ABSTRACT

The ultimate goal is to investigate the trend of quarterly inflationary rate in Nigeria. The specific objectives were to estimate model parameters, select the most parsimonious model among candidate models as well as to forecast on the basis of the fitted model. The data used in this study was extracted from www.nigerianstat.gov.ng. The consumer price index for food sector which span from January 2009 to July 2019 was used. A dataset of one hundred and twenty (120) cases was used to build the model while seven (7) cases were used for testing the model. The linear trend, non- seasonal ARIMA (1,2,0) and seasonal ARIMA (1,2,0)(1,0,0)^{12} models were used for forecasting after training the data sets. In adjusting for stationarity, the series was found to be stationary after second finite differencing. Augmented Dickey Fuller (ADF) test was used to assess the stationarity with a p-value of 0.042. The ACF and PACF plot were assessed and it was found that the differenced series followed autoregressive terms. The analysis suggests that ARIMA models can be used to model Nigeria consumer price index. There is a rising trend in the consumer price index inflation of food sector in Nigeria. The seasonal ARIMA (1,2,0)(1,0,0)^{12} is more parsimonious than Non-seasonal ARIMA (1,2,0) and linear trend equation. Also, the seasonal ARIMA (1, 2, 0)*(1, 0, 0)^{12} is most suitable for forecasting consumer price index as measure of inflation in Nigerian Food Sector. Findings of this study should enable the orientation of policies targeted towards curbing the increasing inflationary rate in the food sector of Nigeria.*

Keywords: Consumer price index, forecast, inflation, time series,policies and food

1.0 INTRODUCTION

Prices rise and fall periodically for economic or social reasons. Sellers in community, labour and capital markets do not fix prices of commodities. In the community market producer or sellers complain of increasing cost. While, employees in the labour market form unions and fight for increased wages to enable them meet up with high cost of living and depreciation in the purchasing power of money. Also, suppliers of land and capital increase their rents and interest rates with complain of rising cost of funds. Invariably,prices continue to go up from time to time. Prices rising generally at very fast rate cause the populace to worry. The effect of the rising prices become significant to an economy and may lead to inflation. Inflation is an inordinate rise in the general level of prices, a process of continuously rising prices, or equivalently, of a continuously falling value of money. The most commonly used measures of inflation are the percentage rate of change in a country's Consumer Price Index or in its Gross National Product deflator.

In 110 OECD countries over a 30-year period, (McCandless and Weber, 1995) found that growth rates of the money supply and the general price level are highly correlated. They explained that the correlation between money growth and inflation being close to one implies that long-run inflation can be adjusted by adjusting the growth rate of money. Also,(Rolnick and Weber, 1995) examined the behavior of money, inflation, and output under fiat and commodity standards for 15 countries. They found that under fiat standards, the growth rates of various monetary aggregates are more highly correlated with inflation and with each other than they are under commodity standards.

The factors that may affect the level of inflation can be grouped into institutional, fiscal, monetary and balance of payments. Here, (Cukierman et. al, 1992) and (Alesina and Summers, 1993) have shown that the level of independence for legal, administrative, and instrument of the monetary authority is an important institutional factor that determines inflation, especially, in industrialized countries. The rate of turnover of central bank governors in developing countries was seen as an important factor influencing inflation. However, it was emphasized that caution should be exercised in the interpretation of these findings, given the difficulty in measuring the actual level of independence of a central bank.

Again, (London, 2008) provides empirical evidence on the relationship between money and inflation in Africa. Using both cross-section and time series econometric analysis, shows that the simple monetarist inflation model appears to hold when tested in cross- section equations covering several countries and averaged over several years. The same may generally not be true for individual countries in time series analysis or cross- section studies. London analysis strongly suggests that factors other than the rate of monetary expansion have played an important role in determining short-run inflation trend in Africa, and given the lesser role that are to be assigned to monetary factors over the short-run, the study urges greater flexibility in deploying policy instruments towards inflation target in African countries and caution against the application of rule based on regional result in favour of those derived from country-specific findings.

Similarly, (AminuandAnono, 2012) investigated the impact of inflation on economic growth and development in Nigeria between 1970 and 2010 through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP and inflation. The results of unit root suggest that all the variables in the model are stationary and the results of Causality suggest that GDP causes inflation and not inflation causing GDP. The results also revealed that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity. A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country. A major policy implication of this result is that concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to boost the growth of the economy. Inflation can only be reduced to the bearest minimum by increasing output level (GDP).

The determinants of inflation in Nigeria between 1981 and 2003 was examined by (Fatukasi, 2012). The study revealed that all explanatory variables namely, fiscal deficits, money supply, interest and exchange rates significantly impact the rate of inflation in Nigeria during the period under review. The explanatory variables accounted for 72% of the variation in inflation during the period with the error terms capturing 28% of the variation. This research contributes to the idea that the causes of inflation in Nigeria are multi-dimensional and dynamic. A good knowledge of inflation will help to proffer solutions to the inflationary trends in the country and could lead to high productivity and improved living standard of the citizenry.

Evidences are present to show that inflationary pressures started off from agricultural or food sector of the Indian economy (Sengupta, 1991).

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In addition, (Monika and Ram, 2017) examined whether the inflation rate is related to agricultural production. The study was based on secondary data collected from various sources by employing two-step co-integration. The empirical result revealed that trends in agricultural production on both headline and food inflation trends are co-integrated and have a long-run relationship. It was observed that the relationship between inflation rate and agricultural production is negative and the sensitivity of inflation to changes in agricultural production was larger than that of agricultural production to changes in inflation rates. The fall in agricultural production creates a situation of food shortage relative to demand and thus leads to what is called food shortage inflation. This spreads to other sectors, causing the general price level to move up (Gupta, 1974).

Inflation starts when the aggregate supply of essential food items fall short of the demand or its growth rate declines relative to demand on account of natural and structural constraints (Mithani, 1993). This implies that natural calamities like flood or drought, and infrastructural bottlenecks in agriculture causes shortfall in production thereby making the supply of agricultural/ food articles to fall short of demand, causing their prices to hike up and get transmitted to non-food articles, resulting in inflation in the general level of prices. It thus, can be said that the price level in India is largely governed by the agricultural production (Narain,1959).This is particularly true in case of a developing country like India, as the considerable proportion of the people depends upon agriculture as livelihood and the agricultural sector contributes significantly to the national income. Low per capita income implies a large portion of income is devoted to food grains and the demand for it being largely inelastic, a fall in agricultural/food grains production causes steep rise in prices. It is on this background that the study endeavours to correlate agricultural production with the inflation in the country.

Again, (Kibritcioglu, 2002) confirms the persistence of inflation in Turkey as a net result of sophisticated dynamic interaction of four group of explanatory factors of demand-side (monetary) shock, supply-side (or real) shocks, adjustment factors, and political processes. This means that an inflationary growth is a result of in-appropriation of various structural and economic factors. Whereas,(Qayyum, 2006) found a strong linkage between excess money supply growth and inflation in Pakistan for the period 1960– 2005. He argues that excess money supply first impacts on the real GDP before it affects inflation.

In addition, (McCallum and Nelson, 2010) considered the relationship existing between monetary aggregates and inflation, and whether there is any substantial reason for modification of policy analysis. After affirming the Friedman's proposition which says that if a change in the quantity of (nominal) money were exogenously engineered by the monetary authority, then the long-run effect would be a change in the price level (and other nominal variables) of the same proportion as the money stock. With no change resulting in the value of any real variable, they hold a contrasting view that, the monetarist proposition holds in a model economy if, and only if the model exhibits the property known as long-run "neutrality of money" They therefore challenge the view that has been widely expressed in the literature, both by critics and advocates of the use of money in monetary policy analysis.

In any contemporary society one major target of macroeconomic policies is to achieve stability in price level. Stability here does not mean a situation where price will remain fixed but rather a situation where variation in price over a long period is minimal.

The ultimate goal is to investigate the trend of quarterly inflationary rate in Nigeria, while the specific objectives were to estimate model parameters, select the most parsimonious model among candidate models as well as to forecast on the basis of the fitted model. Findings of this

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study will enable the federal government to fight inflation through introducing contraction monetary and fiscal policies.

2.0 MATERIALS AND METHODS

This section describes data and methods used for this research.

2.1.0 Method of Data Collection

The data used in this study was extracted from www.nigerianstat.gov.ng. The consumer price index for food sector which span from January 2009 to July 2019 was used. A dataset of one hundred and twenty (120) cases was used to build the model while seven (7) cases were used for testing the model.

2.1.1 Time Plots

The starting point of a time series analysis is the plotting, which is the drawing of the time plots. A timeplot (sometimes called a time series graph) displays values against time. They are similar to x-y graphs, but while an x-y graph can plot a variety of "x" variables (for example, height, weight, age), time plots can only display time on the x-axis. Time plots can have an upward trend or a downward trend.

2.1.2 Stochastic Process

Stochastic process is a phenomenon that evolves over time in accordance with certain probability laws. While, time series is a realization of stochastic process. Thus, in analysing a time series, we regard the observation $y_t$at a given time t as a realization of a random variable $Y_t$with probability density function $f(y_t)$. The observations at any 2 times t_1 and t_2 may be regarded as realizations of two random variables yt_1 and yt_2 with joint pdf $f(y_{t1}, y_{t2})$. In general, the entire sequence of observations $y_{t1}, y_{t2}, \ldots, y_{TN}$making up the series may be regarded as a realization of N-dimensional random variable $(Y_{t1}, Y_{t2}, \ldots, Y_{TN})$ with probability density function $f(yt_1, yt_2, \ldots, yt_N)$.

2.1.3 Stationarity

A stationary time series is a time series whose statistical properties do not change over time. A stationary time series is one whose statistical properties such as mean, variance, autocorrelation, etc. are all constant over time. Stationarity shows the mean value of the series that remains constant over a time period; if past effects accumulate and the values increase toward infinity, then stationarity is not met. A stochastic process in such a state of statistical equilibrium is referred to as a stationary stochastic process. If the statistical properties of the stochastic process are not affected by a change of time origin, the process is said to be strictly stationary.

2.1.4 The Mean and Covariance Function

The mean of a stationary stochastic process will be denoted by μ and is given by

$$\mu = E(Y_t) = \int_{-\infty}^{\infty} ytf(yt)dyt \text{ ...... Equation 1}$$

for any time t. This definition implies that a stationary stochastic process has a constant mean or level about which the process fluctuates. The variance of a stationary stochastic process denoted by

$$6^2 = E\,[yt - \mu]^2 = \int_{-\infty}^{\infty} ytf(yt)dyt \text{ ...... Equation 2}$$

for any time t.

The variance is a measure of the fluctuation of the stochastic process about its level. If the process is stationary, the means and similarly the variances are all the same.

2.1.5 The Auto Covariance Function

The autocovariance of a random variable y_t and y_{t+k}separated by a constant time interval or lag k is denoted by c_k.The autocovariance is a measure of the linear dependence between two random variables separated by a fixed number of time periods or lag k.

2.1.6 The Auto Correlation Function

Autocorrelation, also known as serial correlation, is the correlation of a signal with a

AIC = $n + n \log 2\pi + n \log(RSS/n) + 2(p + 1)$-------Equation 3

2.1.9 Bayesian Information Criterion

Bayesian Information Criterion (BIC) or Schwarz Criterion (SBIC) is a criterion for model selection among a finite set of models; the model with the lowest BIC is preferred. It is based, in part, on the likelihood function and it is closely related to the Akaike Information Criterion (AIC).The formula for BIC is given as:

BIC = $n + n \log 2\pi + n \log(RSS/n) + (\log n)(p + 1)$-------Equation 4

2.2.0 Autoregressive Processes

In statistics and signal processing, an autoregressive (AR) model is a representation of a type of random process; as such, it is used to describe certain time-varying processes in nature, economics, etc.The idea behind the autoregressive models is to explain the present value of the series, X_t , by a function of p past values, $X_{t-1}, X_{t-2}, \ldots, X_{t-p}$.

An autoregressive process of order p is written as

$X_t = \varphi_1 X_{t-1} + \varphi_2 X_{t-2} + \ldots + \varphi_p X_{t-p} + Z_t$-------Equation 5

where $\{Z_t\}$ is white noise, i.e., $\{Z_t\} \sim WN(0, \sigma^2)$, and Z_t is uncorrelated with X_s for each $s < t$.

We assume (for simplicity of notation) that the mean of X t is zero. If the mean is $E X_t = \mu$ 6= 0, then we replace X t by $X_t - \mu$ to obtain

$X_t - \mu = \varphi_1(X_{t-1} - \mu) + \varphi_2(X_{t-2} - \mu) + \ldots + \varphi_p(X_{t-p} - \mu) + Z_t$-------Equation 6

what can be written as

$X_t = \alpha + \varphi_1 X_{t-1} + \varphi_2 X_{t-2} + \ldots + \varphi_p X_{t-p} + Z_t$-------Equation 7

where

$\alpha = \mu(1 - \varphi_1 - \ldots - \varphi_p)$.

Other ways of writing AR(p) model use:

Vector notation: Denote

$\varphi = (\varphi_1, \varphi_2, \ldots, \varphi_p)^T$,

$X_{t-1} = (X_{t-1}, X_{t-2}, \ldots, X_{t-p})^T$ -------Equation 8

Then the formula -------Equation 5

can be written as

$X_t = \varphi^T X_{t-1} + Z_t$-------Equation 9

Backshift operator: Namely, writing the model in the form

$X_t - \varphi_1 X_{t-1} - \varphi_2 X_{t-2} - \ldots - \varphi_p X_{t-p} = Z_t$-------Equation 10

and applying $BX_t = X_{t-1}$ we get

$(1 - \varphi_1 B - \varphi_2 B^2 - \ldots - \varphi_p B^p)X_t = Z_t$-------Equation 11

Autoregressive Processes AR(P) using the concise notation we write

$\varphi(B)X_t = Z_t$ --------Equation 12

where $\varphi(B)$ denotes the autoregressive operator

$\varphi(B) = 1 - \varphi_1 B - \varphi_2 B^2 - \ldots - \varphi_p B^p$--------Equation 13

Then the AR(p) can be viewed as a solution to the equation i.e.,

$X_t = 1 \, \varphi(B) \, Z_t$ --------Equation 14

2.2.1 Autoregressive Moving Average

In the statistical analysis of time series, autoregressive–moving-average (ARMA) models provide a parsimonious description of a (weakly) stationary stochastic process in terms of two polynomials, one for the autoregression and the second for the moving average.

The process $\{x_t; t? \ Z\}$ is an autoregressive moving average process of order (p, q), denoted with $x_t \sim$ ARMA(p, q), if $x_t - \varphi_1 x_{t-1} - \ldots - \varphi_p x_{t-p} = u_t + \theta_1 u_{t-1} + \ldots + \theta_q u_{t-q}$--------Equation 15

$?_t? \ Z$ where ut~WN(0, σ_2 u), and $\varphi_1, \ldots, \varphi_p$, θ1, ..., θ_q are p + q constants and the polynomials φ(z) = 1 - $\varphi 1_z$ - ... - φpz p and θ(z) = 1 + θ1 $_z$... + $\theta_{qz\,q}$ have no common factors.

For q = 0 the process reduces to an autoregressive process of order p, denoted with xt~AR(p), $x_t - \varphi_1 x_{t-1} - \ldots - \varphi_p x_{t-p} = u_t$--------Equation 16

? t ? Z, for p = 0 to a moving average process of order q, denoted with $x_t \sim$MA(q) $x_t = u_t + \theta_1 u_{t-1} + \ldots + \theta_q u_{t-q}$--------Equation 17

? t ? Z. The process $\{x_t; t? \ Z\}$ defined by $x_t = 0.3x_{t-1} + u_t + 0.7u_{t-1}$--------Equation 18 ? t ? Z, where $u_t \sim$ WN(0, σ_2 u), is an ARMA(1,1) process. Here φ(z) = 1 - 0.3z and θ(z) = 1 + 0.7z

2.2.2 Autoregressive Integrated Moving Average

In statistics and econometrics, and in particular in time series analysis, an autoregressive integrated moving average (ARIMA) model is a generalization of an autoregressive moving average (ARMA) model. The purpose of each of these features is to make the model fit the data as well as possible.

ARIMA models are, in theory, the most general class of models for forecasting a time series which can be made to be "stationary" by differencing (if necessary), perhaps in conjunction with nonlinear transformations such as logging or deflating (if necessary). A random variable that is a time series is stationary if its statistical properties are all constant over time. A stationary series has no trend, its variations around its mean have a constant amplitude, and it wiggles in a consistent fashion, i.e., its short-term random time patterns always look the same in a statistical sense. The latter condition means that its autocorrelations (correlations with its own prior deviations from the mean) remain constant over time, or equivalently, that its *power spectrum* remains constant over time. A random variable of this form can be viewed (as usual) as a combination of signal and noise, and the signal (if one is apparent) could be a pattern of fast or slow mean reversion, or sinusoidal oscillation, or rapid alternation in sign, and it could also have a seasonal component. An ARIMA model can be viewed as a "filter" that tries to separate the signal from the noise, and the signal is then extrapolated into the future to obtain forecasts.

3.0 RESULTS AND DISCUSSION

The time series plot and model for the data is presented in this section.

3.1 Time Series Plots

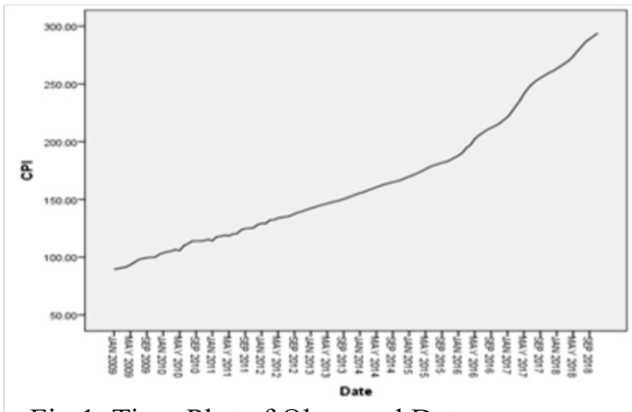

Fig 1. Time Plot of Observed Data

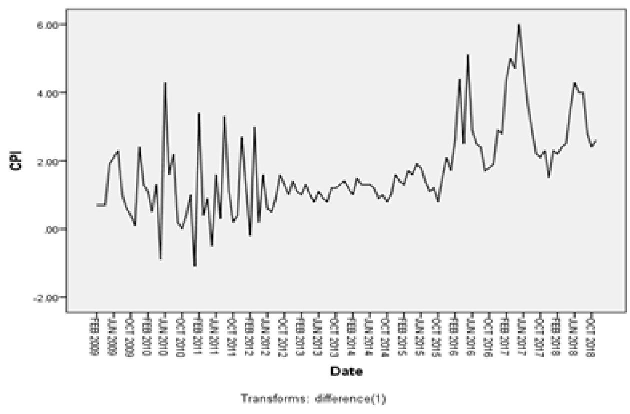

Fig.2 Time Plot after First Differencing

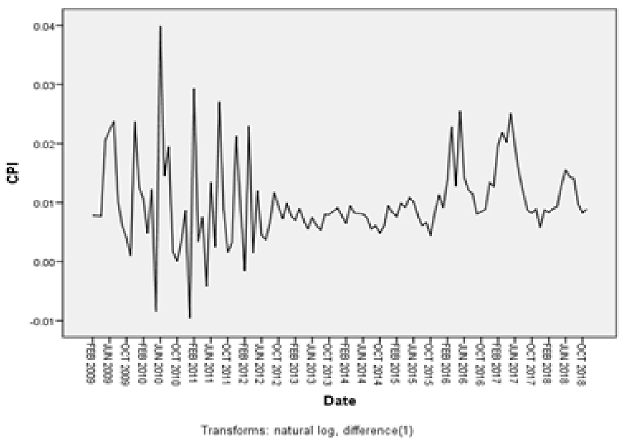

Fig. 3 Time Plot after Natural Log

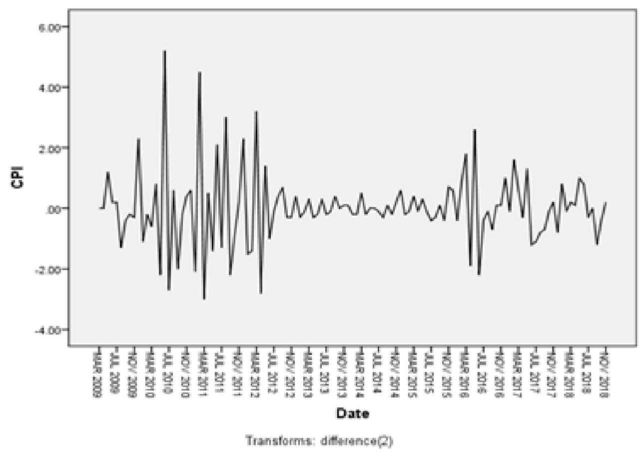

Fig. 4 Time Plot after second Finite Differencing

Fig. 1 showed the actual plot of the training dataset, a long term trend can be observed. It further showed that there is positive increase in trend with a constant variance. In other to adjust for stationary since a series with trend is assumed non-stationary, the observed value was differenced once as shown in Fig..2. Fig .3 showed fluctuation movement in variation after natural log transformation and first finite differencing while Fig .4 showed the movement after second finite differencing only. Augmented Dickey Fuller (ADF) test with intercept was then used to assess the unit root test in other to check for stationary using numerical approach. The result which was tested at 5% level of significance is shown in Table 1 below.

Table 1: ADF with interc ept for unit root test

Variable	**t-statistic**	**p-value**
Level	3.282	1.000
First Differencing	-2.947	0.042*
Log(CPI)	1.118	0.9974

The result from the table above showed that Fig 2 of first differencing has a unit root which means that the series is stationary after second differencing. In other to fit a parsimonious model, the autocorrelation and partial autocorrelation function was plotted for series at second differencing.

In Fig. 5 the autocorrelation plot, alternating negative and positive bars can be observed which showed that the series follows autoregressive model only.

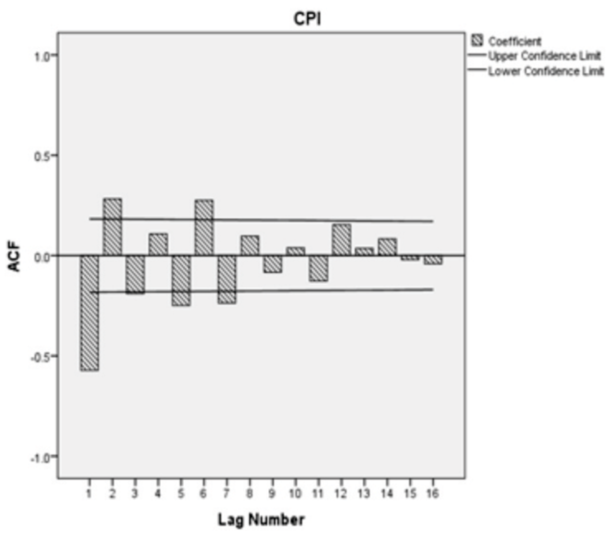

Fig. 5. Autocorrelation Plot of CPI at Second Differencing

An order one of autoregressive model can observed from the partial autocorrelation plot (Fig. 6) since the bars after lag 1 theoretically becomes zero.

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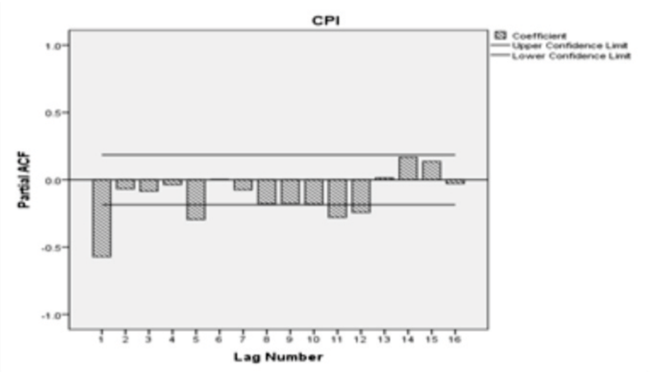

Fig.6. Partial Autocorrelation Plot of CPI at 2nd Differencing

The three candidate model are least square equation, non- seasonal ARIMA (1,2,0) and seasonal ARIMA$(1,2,0)*(1,0,0)^{12}$.

3.2 Fitted Trend Equation

A least square equation was fitted by Minitab Statistical Package, equation 1 below.

Yt = 71.25 + 1.60*t ----------------Equation 19

Accuracy Measures

MAPE 7.377

MAD 12.139

MSD 199.892

The non- seasonal ARIMA (1,2,0) model is given in Table 2 below.

Table 2. Non- seasonal ARIMA (1,2,0)

			Model Type
Model ID	CPI	Model_1	ARIMA(1,2,0)(0,0,0)

In Table 3 we find the ARIMA model parameters.

Table 3. ARIMA Model Parameters

					Estimate	SE	t	Sig.
CPI-Model_1	CPI	No Transformation	Constant		.015	.060	.251	.803
			AR	Lag 1	-.567	.076	-7.451	.000
			Difference		2			

In Table 4 we find the Seasonal ARIMA $(1,2,0)(1,0,0)^{12}$ model.

Table 4. Seasonal ARIMA$(1,2,0)(1,0,0)^{12}$

Model Description

			Model Type
Model ID	CPI	Model_1	ARIMA(1,2,0)(1,0,0)

In Table 5 we find the ARIMA model parameters with seasonal lag

Table 5. ARIMA Model Parameters

					Estimate	SE	t	Sig.
CPI-Model_1	CPI	No Transformation	Constant		.016	.074	.222	.825
			AR	Lag 1	-.590	.075	-7.864	.000
			Difference		2			
			AR, Seasonal	Lag 1	.240	.093	2.590	.011

Forecasting

Three different models were found to be more suitable for predicting after training the datasets; they are linear trend, non- seasonal ARIMA (1,2,0) and seasonal ARIMA$(1,2,0)(1,0,0)^{12}$. The remaining observed consumer price index as a measure for inflation is tested with the corresponding forecast from each model (see Tables 6 & 7).

Table 6. Forecast Values of Inflation Time Series

Date	Observed	Linear Trend	ARIMA(1,2,0)	ARIMA$(1,2,0)*(1,0,0)^{12}$
Jan-19	298.9	264.7	298.9	299.0
Feb-19	301.3	266.3	301.4	301.6
Mar-19	303.9	267.9	304.0	304.3
Apr-19	307.4	269.4	306.5	307.0
May-19	311.7	271.1	309.1	309.9
Jun-19	316.0	272.6	311.6	313.1
Jul-19	319.9	274.1	314.2	316.2

Table 7. Forecast results for Inflationary time

Model	Stationary R-Squared	RMSE	MAPE	MAE	Normalized BIC
Linear Trend	-	-	7.377	-	-
ARIMA (1,2,0)	0.327	1.024	0.490	0.706	0.128
ARIMA $(1,2,0)*(1,0,0)^{12}$	0.365	1.000	0.466	0.665	0.120

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The Multiple Time plot is shown in Fig. 7 below.

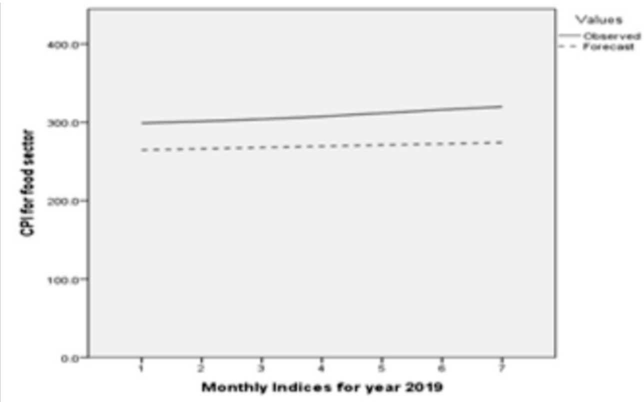

Fig. 7: Multiple Time plot (Linear Trend)

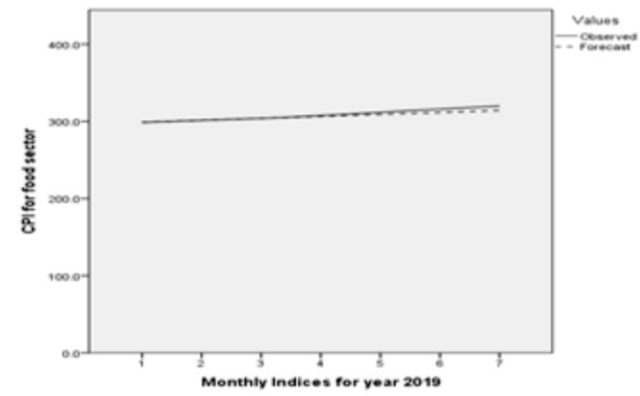

Fig. 8: Multiple Time plot (Non-Seasonal ARIMA (1,2,0))

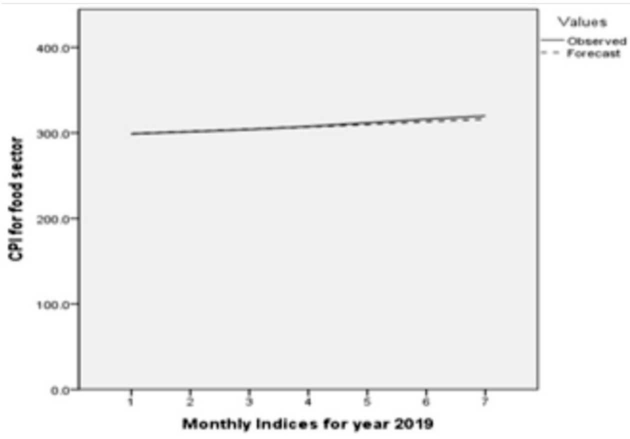

Fig. 9: Multiple Time plot (Seasonal ARIMA $(1,2,0)^*(1,0,0)^{12}$)

From the predictive measures, it can be observed that Seasonal ARIMA $(1,2,0)^*(1,0,0)^{12}$ (Fig. 9) is more parsimonious than Non-seasonal ARIMA(1,2,0) (Fig. 8) and linear trend equation while considering goodness of fit measures such as RMSE, MAPE, MAE and Normalized BIC. Meanwhile, ARIMA(1,2,0) is more parsimonious in terms of Stationary R-squared. The result show that Seasonal ARIMA $(1,2,0)^*(1,0,0)^{12}$is most suitable for forecasting consumer price index as measure of inflation in Nigerian Food Sector.

The Box and Jenkins approach was used as a guide in modeling the consumer price index to measure inflation. The study made use of one hundred and twenty (120) monthly indices from January 2009 to December 2018 in training the model while the rest seven (7) data in 2019 were used to test the model. The components of the candidates model after training the series include linear trend equation, ARIMA (1, 2, 0) and the seasonal ARIMA $(1, 2, 0)^*(1, 0, 0)^{12}$.

Time plot of the actual observed series showed an upward long-term trend. This implies that inflation is on the increase for every consecutive year. In adjusting for stationarity, the series was found to be stationary after second finite differencing. Augmented Dickey Fuller (ADF) test was used to assess the stationarity with a p-value of 0.042 which is less than 0.05. The ACF and PACF plot were assessed and it was found that the differenced series followed autoregressive terms. The linear trend, ARIMA (1, 2, 0) and seasonal ARIMA (1, 2, 0)*(1, 0, 0) of period 12 are then considered as appropriate candidates.

The result of seven (7) monthly indices out of sample forecast of the food sector inflation rate which span from January 2019 through to July 2019 were used to determine the predictive abilities of the three models using various predictive measures as shown in Table 7. From the predictive measures, it can be observed that Seasonal ARIMA $(1,2,0)^*(1,0,0)^{12}$ is more parsimonious than Non-seasonal ARIMA(1,2,0) and linear trend equation based on goodness of fit measures such as RMSE, MAPE, MAE and Normalized BIC. Also, it has the highest Stationary R-squared value compared to other candidates. The result show that Seasonal ARIMA $(1, 2, 0)*(1, 0, 0)^{12}$ is most suitable for forecasting consumer price index as measure of inflation in Nigerian Food Sector.

Inflation is one of the major macroeconomic problems that confront the Nigerian economy today. Therefore, the knowledge of the modeling and forecasting of inflation in Nigeria could be the necessary prerequisite to evolving a long term solution. The rising trend in the consumer price index inflation of food sector in Nigeria may be the result of large nets importers of food and as such households spend greater percentage of their income on food in Nigeria which subsequently increases the cost of living.

4.0 CONCLUSION AND ACKNOWLEGEMENTS

The analysis suggests that ARIMA models can be used to model Nigerian consumer price index. There is a rising trend in the consumer price index inflation of food sector in Nigeria. The three candidate models are least square equation, non-seasonal ARIMA (1,2,0) and seasonal ARIMA$(1,2,0)*(1,0,0)^{12}$. The seasonal ARIMA $(1,2,0)*(1,0,0)^{12}$ is more parsimonious than Non-seasonal ARIMA(1,2,0) and linear trend equation. Also, the seasonal ARIMA $(1, 2, 0)*(1, 0, 0)^{12}$ is most suitable for forecasting consumer price index as measure of inflation in the Nigerian Food Sector.

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