

INFLATIONARY TRENDS AND ITS DETERMINANTS IN NIGERIA

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ABSTRACT

This study examined Nigerian inflationary trends and drivers from 1985 through 2021(37years). The study explored how Money Supply (MS), Dollar Exchange Rate (DEXCHR), Government Expenditure (GEXP), and National Debt (NDT) affect Nigeria's Inflation Rate (INFLR). The Autoregressive distributed lag model showed mixed integration in aggregate secondary data from a CBN Statistical Bulletin. The model's multicollinearity and heteroskedasticity tests showed that it is homoskedastic and fit for prediction. MS only passed the statistical significance test long-term. This result means that MS is a strong predictor of INFLR in the long run (P -value = 0.0226) but not in the short run (P -value = 0.5056); DEXCHR had a positive but insignificant effect on INFLR in both the short and long runs (p -values = 0.3842 and 0.3981, respectively); LogGEXP had a negative but significant effect on INFLR in both the short and long runs (p -values = 0.0362 and So, inflationary factors do not affect INFLR in Nigeria very much. The report advised the central bank to stop printing cheap currency to reduce money supply.

Keywords : Inflation, Money Supply, Exchange, Expenditures and Debt.

INTRODUCTION

Every economy experiences inflation, but its rate, causes, and character vary. Most wealthy nations aim towards 2% inflation. Inflation lowers a nation's purchasing power (McBride, 2019), encouraging consumption and capital investment while discouraging savings (I.J. et al., 2021). Inflation boosts living costs, lowers living standards, and rises borrowing costs (Inim et al.,

2020). Inflation may make local industry prices less competitive than other countries, impacting export sectors and risking local industry viability (Boel, 2018; Mohseni & Jouzaryan, 2016; W. Madurapperuma, 2016). If left unchecked, it could cause hyperinflation like Nigeria's, which exceeds 100%.

The 21st-century economy's main goals are price stability and low inflation (McBride, 2019). Anfofum et al (2015) found that a 2-6% inflation

rate boosts earnings, consumption, investment, creativity, invention, and production. Double-digit inflation hurts consumers and economic growth (EG). Since the 1970s, inflation has plagued industrialised and emerging economies, particularly Nigeria. Economists define inflation as a general, continuous, and persistent rise in an economy's price level. Inim et al (2020); Uchenna Okoye et al. (2019) define inflation as a widespread, continuous, and persistent rise in prices. Inflation requires "general, continuous, and persistent" price increases in goods and services. Inflation lowers global EG and development indicators.

Accelerated inflation has numerous detrimental repercussions on a domestic economy. What causes inflation? Authors have offered many causes for economies experiencing inflation. They try to explain inflation, but the causes vary every country (Amassoma, Sunday, et al., 2018). Nigerians believe that the dollar exchange rate, wide money, national debt, oil prices, government spending, and population cause inflation (Agyire-Tettey, 2017).

In Nigeria, rising commodity prices indicate inflationary pressures, which have caught the attention of economic leaders (Okotori, 2017). The International Monetary Fund (IMF) adds structural reforms to macroeconomic policy to complete an effective trio for macroeconomic stabilization (Okotori, 2017). Due to inflation,

corruption, and unemployment, the Nigerian economy is underdeveloped despite its vast human and natural resources (Ojomolade, 2018). Double-digit inflation reduces investment, production, and wages while increasing consumption. It diminishes financial asset returns and makes borrowers' and lenders' gains and losses unclear (Ojomolade & Oni, 2018; Okotori, 2017). Excessive inflation erodes GDP gains and hurts the poor, forcing government budgets to rise as budgetary imbalances solidify and macroeconomic instability returns.

Devaluation raised import prices, lowering agricultural output. Due to excessive financial institution lending to individuals and enterprises, inflation rose to 72.8% in 1995 (Okotori, 2017). Uncontrolled inflation rate disrupted consumption, investment, and production behaviour in Nigeria. Amassoma et al (2018; I.J. et al (2021) listed dollar exchange rate, broad money, national debt, oil prices, government spending, population, and others as inflation determinants. This study examines Nigerian inflation and its causes from 1985 through 2021.

Nigerians are affected by inflation. When prices rise, many sectors become inactive or become less productive. Before controlling inflation, Nigeria must determine all variables that significantly affect it. This study uses 1985–2021 annual historical data to identify significant inflation factors. Understanding Nigeria's primary inflation factors is crucial when inflation rises.

Several studies have done it, but they employed few macroeconomic variables, so more research is needed.

In answering questions about inflationary tendency and its drivers, I.J. et al (2021); Inim et al (2020); Sahnoun & Abdennadher (2019); Sasongko & Huruta (2019) gave numerous explanations. Money supply, economic expansion, currency devaluation, etc. generate inflation, they say. They found a favourable association between several macroeconomic variables and inflation with some discrepancies. Contradictions indicate that inflation's causal linkages with other economic indicators are still debated. Thus, each economy should be researched separately to determine inflation determinants.

Country-specific factors cause inflation. These economic drivers are supply and demand forces. Supply-side variables raise production costs and produce inflation. Output growth, capital creation, import prices, exchange rate, tax, and wage are supply-side factors. Demand-side variables reduce money's purchasing power, causing inflation. Money supply, private consumption, and government spending all affect Nigerian inflation (I.J. et al., 2021).

Several experts have studied how inflation affects various economic sectors in developing and established nations. (Adeleye et al., 2017; Okoye et al., 2017; Olokoyo et al., 2009; Uchenna Okoye et al., 2019). Its cause is rarely

studied, especially in underdeveloped nations. This study uses autoregressive distributed lag econometrics to identify inflationary trends (INFLR) and their determinants (MS, DEXCHR, GEXP, and NDT) in Nigeria (ARDL).

Inflation, a common economic phrase, is often misunderstood. There are several theories on inflation, but economists agree that it is a constant rise in prices. A rising consumer price index (CPI) or implicit price deflator for Gross National Product (GNP) could characterise it (GNP). "Too much money chasing fewer things" describes inflation. Inflation devalues currency (Chude & Chude, 2015).

The prices of goods and services slowly go up over time. This situation is called "creeping inflation." It helps the economy grow because it makes people more likely to invest. (Jhingan, 2015)

In hyperinflation, money loses its meaning as a store of value because the inflation rate can no longer be measured and is out of anyone's control. (Jhingan, 2015)

Price or wage inflation means that prices or wages go up because workers or employees want them to because prices have increased overall (Chude & Chude, 2015).

Running inflation: When a horse is running, this inflation overgrows at a rate of about 10 to 20% per year, which hurts the middle class and people with low incomes. To control it, we need

the proper financial and fiscal steps. (Jhingan, 2015)

Money supply and inflation: Ojomolade & Oni (2018) say that inflation happens when the money supply grows faster than the economy can make new goods and services. Inflation is a long-term rise in the general price level of goods and services. A rapid increase in the amount of money in the economy leads to a corresponding increase in productivity, which increases the overall demand for goods and services to meet current prices (Sola & Peter, 2013).

Exchange rate and inflation: Exchange rate—the value of the native currency in foreign currency terms—affects inflation. Eze. T. C. & Okpala (2018) report that Nigeria's exchange rate policy has changed from a fixed rate in 1960 to a pegged rate between the 1970s and mid-1980s to a variant of the floating rate from 1986 with the introduction of the Structural Adjustment Programme to achieve a realistic exchange rate for the naira and reduce inflation.

Government expenditure and inflation: Government expenditure (GE) funds social services and territorial security. Inflation is the sustained price of goods and services in the economy (I.J. et al., 2021).

National Debt and inflation: is the central government's total debt, including internal and external debt from the IMF and World Bank in Nigeria. National debt increases will boost inflation. Since Nigeria's national debt has been

rising for two decades, we expect it to lower inflation (Uchenna Okoye et al., 2019).

Myrdal and Streeten proposed structural inflation theory (Canavese, 1982). LDC inflation is structural (LCDs). In I.J. et al (2021), (I.J. et al., 202)Canavese (1982) challenged standard aggregative analysis for LDCs. Traditional aggregative analysis assumes balanced and integrated economic systems where production, consumption, backward and forward linkages in response to market signals are smooth and rapid, making aggregate demand and supply rational. Most LDCs have unstable economies, undeveloped agriculture, weak institutions, underutilised natural resources, and recurrent war. LDC aggregation is difficult.

Structuralists link LDC inflation to development and structural deficits. Literature cites resource, food, foreign exchange, and infrastructure shortages. To understand LDC inflation, one must identify the sources of numerous bottlenecks in the normal development process, examine how these bottlenecks produce price hikes, and study how these price rises affect the economy. Structuralism guides Nigeria, a growing nation.

"Only money matters," said Milton Friedman (1912–2006), making monetary policy a greater macroeconomic tool than fiscal policy for stabilising the economy. Money supply "dominates, though not exclusively" long-term and short-term pricing and production, according

to monetary economists. Monetarists emphasise money, monetarists think "inflation is everywhere and everywhere," therefore when money supply inflation surpasses commodities real production interest rates, prices rise (Chude & Chude, 2015).

Keynesians attribute demand-pull inflation to rising aggregate demand. Investment, government, and consumption comprise aggregate demand. Inflation rises faster as aggregate demand exceeds collective supply. Keynesians believe production factors and constants may raise prices before full employment. According to the demand-pull paradigm, inflation occurs when aggregate demand for goods and services exceeds aggregate supply and cannot be fulfilled by running down stocks, moving commodities from the export market to the domestic market, boosting imports, or postponing demand (Abraham A. et al., 2018).

I.J. et al., (2021) analysed Nigeria's inflation determinants using co-integration. The analysis used CBN statistical bulletin secondary data (2012-2018). ARDL analysed. Real and lagged government expenditure, exchange rate, money supply, and crude oil price cause Nigerian inflation. Exchange rate depreciation lowers inflation, while dropping crude oil prices raise it. Government spending and money supply increases increase prices. Inflation and

government spending are linked through long-term co-integration and boundaries.

Inim et al., (2020) used ARDL to analyse various inflation variables in Nigeria using quarterly data from January 1999 to December 2018. Inadequate infrastructure, exchange rate, political instability, corruption, and double taxation also cause inflation. Data imply other factors influence inflation. ARDL shows a strong long-short relationship.

Smauel et al., (2019) looked at the missing link between money supply and inflation in Nigeria using monthly CBN data from January 2010 to December 2018. Inflation causes things other than the money supply, such as political instability, corruption, double taxation, and a lack of social, economic, and financial infrastructure.

Uchenna Okoye et al., (2019) looked into the causes of Nigeria's inflation. ARDL estimates show that inflation is affected by foreign debt, exchange rates, budget deficits, money supply, and economic growth. Lagged inflation also affects inflation in the present. Nigeria's inflation did not change over time because of the interest rate.

Amassoma et al., (2018) analysed Nigerian inflation and money supply. Curiosity drove the study to investigate the immediate cause of Nigeria's high inflation rate, which is impacting the populace. The variables' long-term and short-term dynamics were determined using co-integration test and error correction on annual

time series data from 1970 to 2016. Inflation was unaffected by money supply during the recession. Error correction is big and negative, correcting 21% yearly. Granger causality says money supply does not drive inflation in Nigeria during the research period.

Amassoma, S. Keji, et al., (2018) examined Nigerian money supply and inflation from 1970 to 2016. The study uses CBN secondary data and Co-integration and ECM methodology. Money supply has no effect on inflation or vice versa. Nigeria's 2015–2017 recessions caused causation issues.

Hamza & Zunaidah (2017) evaluated long-term relationships between exchange rate, broad money supply, GDP, interest rate, financial instability, oil price, and inflation. ARDL was applied to 1970–2014 annual time series data. This study found a long-term correlation. The exchange rate, wide money supply, oil price, and inflation had a positive long-term relationship, but financial instability, interest rate, GDP, and broad money supply nominal effective exchange rate irritation term had a negative relationship.

Bashir et al., (2016) explored Pakistani inflation factors using autoregressive and distributed lag models (ARDL). In Pakistan, government expenditure, imports, revenue, and external debt cause long-term inflation.

Ojarikre et al., (2015) examined Nigeria's 1981–2012 inflation-public expenditure relationship. He demonstrated a long-term

association between variables using econometric tests like ADF for Unit Root, Johansen Co-integration, and Granger Causality. Government expenditure growth and inflation did not connect over the period investigated.

Literature Gaps: Based on the empirical assessment, few recent research has explored inflationary trends and drivers in Nigeria, but their conclusions are inconsistent. No Nigerian study has combined inflation determinants like this one. So, this study examined inflationary trends and their drivers in Nigeria using an ARDL technique to account for the time-varying nature of the variables, which many researchers have neglected.

METHOD

This study used quasi-experimental design. Quasi-experimental methodology was used to investigate the causal effect of inflation factors on Nigeria's inflation rate.

The CBN Statistical Bulletin provided data for the research. Secondary data was chosen because it is speedier, decreases data gathering time, is non-reactive, often available for re-analysis, gives a broad background, and enhances learning curves. The study employed this dependable and accurate data source.

This study used unit root test, ARDL Bound Co-integration test, and ARDL Co-integrating and Long form estimation tools. These analyses examined the short- and long-

Source: Econometric Views Version 9.0 Output (2022)

The evidence provided in Table 1 show significant variations in the variables given the large differences between the maximum and minimum values of the series. The summary statistics evidenced that the study variables covered a study period of 37 years (1985 to 2021). Again, INFLR reported an average and standard deviation (SD) value of 19.22 and 18.20 suggesting that INFLR deviate little away from the mean value. Meanwhile, INFLR reported had a minimum and maximum value of 0.20 and 76.80 respectively throughout the study periods. Further, MS reported an average and SD value of 23.03 and 15.54 suggesting that MS did not deviate much away from the mean value. Meanwhile, MS reported had a minimum and maximum value of 1.29 and 15.54 respectively throughout the study periods. DEXCHR reported an average and SD value of 136.03 and 96.54 suggesting that DEXCHR deviate much away from the mean value. Meanwhile, DEXCHR reported had a minimum and maximum value of 6.34 and 401.98 respectively throughout the study periods. LogGEXP reported an average and SD value of 2.91 and 0.89 suggesting that OR did not deviate much away from the mean value. Meanwhile, LogGEXP reported had a minimum and maximum value of 1.12 and 4.09 respectively throughout the study periods. Lastly, evidenced that LogNDT reported an average and SD value of 3.39 and 0.73 suggesting that

standard deviation is greater the mean value. Meanwhile, LogNDT reported had a minimum and maximum value of 1.66 and 4.55 respectively throughout the study periods.

Table 2: Correlation Matrix

	INFLR	MS	DEXCHR	LOGGEXP	LOGNDT
INFLR	1.000000				
MS	0.290215	1.000000			
DEXCHR	-0.319090	-0.356816	1.000000		
LOGGEXP	-0.384112	-0.201804	0.770345	1.000000	
LOGNDT	-0.279082	-0.198868	0.784819	0.964300	1.000000

Source: Econometric Views Version 9.0 Output (2022)

The correlation matrix reported in table 2 above revealed that DEXCHR, LogGEXP and LogNDT exerted negative correlation with INFLR in Nigeria while MS, exerted positive correlation with INFLR in Nigeria. Furthermore, LogGEXP reported a coefficient value of -0.3841 suggesting that the correlation between LogGEXP and INFLR and is high, though is negative. Meanwhile, the rest study variable reported low correlation. Generally, the result from the table shows that problem of multi-collinearity is not anticipated. Though, a further test will be carried out to ascertain this condition.

Table 3: Multi-collinearity Test

Variables	Variance Inflation Factor	Tolerance Value
MS	0.026634	1.379272
DEXCHR	0.001852	3.748189
LogGEXP	0.001404	4.615880
LogNDT	0.001142	6.516527

Source: Econometric Views Version 9.0 Output (2022)

From the above Table 3, the tolerance level of MS is 0.0266 that of DEXCHR is 0.0019; LogGEXP is 0.0014, LogNDT for 0.0011; which indicates that about 2.66%, 0.19%, 0.14% and 0.11% Variation in the predictor variables cannot be forecast by the variables of the other predictors. This result is because their tolerance values are higher than 0.10, while their variance inflation factors are less than 10. This result shows that there is not a problem with multiple correlations.

Table 4 Data Validity Test

Table 4: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.204307	Prob. F(2,27)	0.3155
Obs*R-squared	2.948460	Prob. Chi-Square(2)	0.2290

Source: E-VIEW, 9.0 Outputs, 2022.

Before estimating the model, we first check the residuals of the variables to see if there is a serial relationship. The serial correlation LM test uses to figure this out. In Table 4, the serial correlation LM test shows no serial correlation in the models because the p-values of the f-statistics are not statistically significant at the 5% significance level.

Table 5: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.382155	Prob. F(6,29)	0.0641
		Prob. Chi-Square(6)	0.0646
Obs*R-squared Scaled explained SS	11.885212	Prob. Chi-Square(6)	0.0639

Source: E-VIEW, 9.0 Outputs, 2022.

Heteroskedasticity is a problem when the range of values of a second variable that

predicts the first variable differs from that of the first variable. The Breusch-Pagan-Godfrey heteroskedasticity test uses to make sure that there is homoscedasticity in the model evaluation. With this finding, there is no problem with heteroskedasticity in the models because the p-values of the f-statistics are not significant at a 5% significance level. From the table above, the P-value of the chi-square which stood at 0.0764. This gives us prove that there is absence of Heteroskedasticity in the study, since it is not significant at 5%. Thus, the null hypothesis that states that the residuals have no constant variance and zero mean is rejected. Hence, we conclude that the model is Homoskedastic (i.e. it has equal variance). On this note, we can boldly state the model is reliable and fit for prediction.

Table 6: Ramsey RESET Test

Equation: UNTITLED
 Specification: INFLR INFLR(-1) MS DEXCHR LOGGEXP LOGNDT C
 Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	4.683732	48	0.1701
F-statistic	21.93735	(11, 28)	0.2901

Source: Econometric Views Version 9.0 Output (2022)

From Table 6 above, it is clear that the Durbin-Watson statistic is correct and that our data shows no signs of correlation. Shows that the model is homoskedastic because the chance values of three parameters are higher than the

0.05 level of significance. The Ramsey test shows that our model is stable and adequately specified.

Table 7: Summary of ADF Test

ADF test at Levels				
Parameter	ADF test statistic	Test critical value @ 5%	Prob.*	Decision
INFLR	-2.980622	-2.945842	0.0463	Stationary
MS	-3.650720	-2.945842	0.0094	Stationary
DEXCHR	2.150722	-2.945842	0.9999	Non-stationary
LogGEXP	-4.229279	-2.948404	0.0021	Stationary
LogNDT	-2.401016	-2.945842	0.1486	Non-stationary
ADF test at 1 st Difference				
INFLR	-5.472809	-2.957110	0.0001	Stationary
MS	-8.203152	-2.948404	0.0000	Stationary
DEXCHR	-3.564701	-2.948404	0.0119	Stationary
LogGEXP	-8.132438	-2.948404	0.0000	Stationary
LogNDT	-4.218947	-2.948404	0.0022	Stationary

Source: Econometric Views Version 9.0 (2022)

The order of integration (stationarity) of the series in the study is from the table above. All series were ADF tested, and the results showed that all series, except DEXCHR and LogNDT, remained at the same level. However, when MS, DEXCHR, LogGEXP, and LogNDT included more, they became stationary at first difference. This result means that at the level and first differencing, all series reached "stationarity," which means they stopped changing. Since our series were found to be stationary at levels (1(0) and first differencing (1(1)), it is essential to look at the long-term link between the factors that cause inflationary trends and INFLR in Nigeria.

Table 8: ARDL Bounds Test

Date: 01/05/23 Time: 07:59
 Sample: 1986 2021
 Included observations: 36
 Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	5.635080	4

Critical Value Bounds

Significance I0 Bound I1 Bound

10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	4.06

Source: Econometric Views Version 9.0 Output (2022)

Table 8 shows that the F-statistic value of 5.635080 is higher than the 5% critical values at the I (0) and I(1) bounds. This result means we reject the null hypothesis and say the variables have a long-term relationship. So, there is a long-term link between the factors affecting price trends and Nigeria's INFLR.

Table 9: ARDL Cointegrating And Long Run Form				
Dependent Variable: INFLR				
Selected Model: ARDL(1, 1, 0, 0, 0)				
Date: 01/05/23 Time: 07:58				
Sample: 1985 2021				
Included observations: 36				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MS)	0.110014	0.163200	0.674108	0.5056
D(DEXCHR)	0.038027	0.043039	0.883558	0.3842
D(LOGGEXP)	21.633278	9.848047	-2.196707	0.0362
D(LOGNDT)	16.362331	13.040865	1.254697	0.2196
CointEq(-1)	-0.621009	0.136331	-4.555152	0.0001
Cointeq = INFLR - (0.7612*MS + 0.0612*DEXCHR - 34.8357*LOGGEXP + 26.3480*LOGNDT + 6.4210)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MS	0.761156	0.315905	2.409447	0.0226
DEXCHR	0.061234	0.071394	0.857694	0.3981
LOGGEXP	-15.151291	2.299191	-6.633811	0.0289

	34.835717			
LOGNDT	26.347997	20.366732	1.293678	0.2060
C	6.420966	31.880010	0.201410	0.8418
R-squared	0.850388	Mean dependent var	0.002910	-
Adjusted R-squared	0.723180	S.D. dependent var	0.136840	
F-statistic	17.79952	Durbin-Watson stat	2.001847	
Prob(F-statistic)	0.000180			

Source: Econometric Views Version 9.0 Output (2022)

The Error Correction coefficient (cointEq-1) is estimated at -0.6210; this means that the model corrects its previous periods disequilibrium at a speed of 62.10% estimated annually. In other words, increasing the determinants of inflationary trends variables at a steady state of 62.10% annually, the determinants of inflationary trends variables will improve significantly in the long run. Given the coefficient of determination as 0.8504 which is 85% supported by high value of adjusted R² as 72%, it presumes that the independent variables incorporated into this model have been able to determine the variation of INFLR to 72%. The F Probability statistic also confirms the significant of this model. Again, the Durbin Watson Statistics clearly revealed that the model is not serially correlated since its value is within the accepted region of acceptance.

The result in table 8 above clearly evidenced that a unit rise in MS will increase INFLR by 0.1100 and 0.7612 (11% and 76.12%) on the short and long run respectively. This further revealed that, the increase in MS in Nigerian economy, it has the likelihood of increasing

INFLR in the country. In terms of statistical significance, MS passed the test of statistical significance only on the long run. This implies that MS is a strong determinant of INFLR in the long run but on the short run is not. This finding is in line with the findings of (I.J. et al., 2021) contrary to the result of (Ojarikre et al., 2015; Uchenna Okoye et al., 2019).

The regression result tested earlier affirmed that LogNDT exerted positive insignificant effect on INFLR in Nigeria both on the short and long run. The implication of the positive result is that 1% rise in LogNDT will only increase INFLR in Nigeria by 16.3623 (1636.23%) and 26.3480 (2634.80%) respectively. Again, its p-values are greater than 5%. Hence, we conclude that LogNDT in a short and long run will have positive insignificant effect on INFLR in Nigeria. This result is in tandem with the findings of (Uchenna Okoye et al., 2019).

CONCLUSION

This study examined Nigerian inflationary trends and drivers from 1985 through 2021. (37years), by exploring how MS, DEXCHR, GEXP, and NDT affected INFLR in Nigeria. The study employed aggregate secondary data from a CBN Statistical Bulletin and ARDL to show mixed integration. The model's multicollinearity and heteroskedasticity tests showed that it is homoskedastic and fit for prediction. Hence, inflationary trends do not significantly affect

INFLR in Nigeria. This study recommends the CBN should stop creating cheap currency to reduce excess money in the economy; the government should cut its wasteful spending and get the budget deficit in Nigeria under control. The government should aim for a low exchange rate regime (possibly an appreciation of the exchange rate) to lower the cost of domestic production. There should be a shift from financing government budgets with debt.

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