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Is Inflation Always and Everywhere a Monetary Phenomenon? Evidence from Nigeria

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Is Inflation Always and Everywhere a Monetary Phenomenon? Evidence from Nigeria

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Abstract

Is inflation always a monetary phenomenon in Nigeria? Autoregressive Distributed Lag (ARDL) results of Nigerian data, spanning 2005q1-2017q4, indicate that changes in money supply have no long-run significant impact on domestic price level behaviour. The results, however, reveal that non-monetary factors: import, global oil price, exchange rate, inflation expectation, fuel pump price and monetary policy rate significantly upsurge inflationary pressure. Conversely, household income (the shadow of unemployment) significantly dampens inflationary pressure while fiscal deficits moderate the pressure. The findings establish the dominance of structural and fiscal dynamics in the inflation equation of the economy.

Keywords: Inflation, Monetary phenomenon, Non-monetary dynamics

JEL Classification: E40, E50

I. Introduction

An extensive examination of data from 110 countries over a 30-year period by McCandless & Weber (1995), employing different definitions of money supply, confirmed Friedman's (1956) postulation that changes in aggregate money supply and general price level have a very high association. However, persistent evolving arguments that supply-side factors can cause inflationary pressure without monetary accommodation (Bernanke, 2005) have eventually gained attention. Further empirical findings suggest that the complexities of inflation extend beyond the confines of supply and demand for money. These include a study of 160 countries over a period of 30 years which revealed that inflation has strong link with monetary growth rate in countries experiencing high inflation, while low-inflation countries have weak relationship between inflation and money growth (De Grauwe & Polan, 2005). The findings rather suggest that inflation dynamics vary across space and time. Hence, the need to appreciate country-specific factors becomes pertinent. These empirical discrepancies imply that factors other than changes in the money supply shocks do cause shifts in the aggregate demand and supply curves (Mishkin, 2013).

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The lack of consensus on determinants of inflationary pressure is a major concern of monetary authorities whose core mandate is price stability. This is a definitive burden on the Central Bank of Nigeria (CBN), the apex institution, where the level of inflation is often regarded as an operational guide in measuring its effectiveness (Sola & Peter, 2013). Thus, inflation expectation gap puts a lot of pressure on the institution such that the adopted inflation management instrument must be pivoted on an optimally efficacious premise. However, in spite of mixed empirical results, inflation management in Nigeria is predicated on quantity theory of money supply with the consequent persistent double-digit inflation in the economy.

The unsettled debate arising from several empirical inquests into the subject matter casts doubts over the probity of inflation being always a monetary phenomenon in the economy. This raises research concerns about the inherent limitations of subduing inflationary pressure sustainably through changes in money aggregates in the economy. This reservation rather suggests the complexities of inflation phenomena within the economic system that are yet to be isolated for effective policy decisions. Hence, further articulation of the efficacy of the extant inflation management strategy along the entire macroeconomic spectrum has become imperative. The motivation for this paper, therefore, is to examine the efficacy of the hypothesis that inflation is always a monetary phenomenon in Nigeria in a more inclusive dynamic system. Unlike previous studies, this investigation includes a wider continuum of separately tested possibilities of inflation drivers in a single dynamic system. This is in recognition of the fact that the prevalence of theoretical and empirical divergence of monetary effects on price level changes has raised uncertainties over the efficacy of existing monetary policy in the country. The significance of the paper lies in its potential to discern the dynamics of aggregate price level changes in Nigeria from the spillover of the robust estimation to augment inflation management in the economy.

II. Literature Review

II.1 The Classical Theories of Inflation

The quantity theory of money (QTM) is one of the oldest surviving economic doctrines of inflation. The theory explains that when there is a change in the supply of money, there is a proportional change in the price level and vice-versa (Fisher, 1911). However, the QTM was challenged by Keynes (1936) who argued that inflation occurs when aggregate demand for final goods and services exceeds the aggregate supply at full (or nearly full) employment. The Keynesians argued further that money supply had an influence on inflation in a

much more complex way than the strict monetarists' assumptions. In spite of the criticisms, the QTM provided the dominant financial framework and formed the intellectual foundation of orthodox policy prescription designed to preserve the gold standard (Friedman, 1956). The growing acceptance of QTM notwithstanding, Myrdal (1959) argued against applying the highly aggregative demand-supply model for explaining inflation in developing countries. Among other post Keynesian theorists, Eichner (2004) demonstrated that several factors exist whose effects are significant in causing inflation in an economy. These included agents such as central banks, revenue authorities, commercial banks as well as other agents which have reasonable impacts on economic balance and, subsequently, perpetuation of inflation. For instance, regulatory authorities make decisions that eventually lead to perpetuation of inflation in the process of determining an optimal level of growth and employment to attain optimal balance in the economy (King, 2002).

In a different perspective, structural theory holds that inflation arises due to structural maladjustments in the economy or some of the institutional features of business environment. Therefore, to explain the origin and propagation of inflation, the forces which generate these bottlenecks or structural rigidities in the process of economic development need to be analysed (Conavese, 1982). Consequently, structural economic theory focused on the fact that economic development depends on a series of distinct structures which, mainly for developing countries, impose constraints to growth and stable price level. In effect, development occurs when the productive structure of the economy are towards industrialisation and technology-intensive. It was pointed out that there is a lack of balanced integrated structure in them where substitution possibilities between consumption and production sectors of the economy are not smooth and the inflation in them cannot be reasonably explained in terms of aggregate demand and aggregate supply (Oise, 2015).

II.2 Empirical Review

The economic thinking in the 1980s and subsequent period was dominated by monetarist theory which maintained that rapid money supply growth is the cause of inflation. However, a review of cross sectional data from 47 countries spanning 1960 by Vague (2016) showed that more high inflation hardly followed rapid money supply growth, and in some cases, there were frequent occurrences of high inflation that were not heralded by rapid money supply growth. This is in consonance with several episodes of real life economic experiences over time. For instance, the massive growth of the money supply in response to the Great Depression between 1929 and 1939 did not bring about inflation. Also, the quantitative easing designed to increase the money supply

during the 2008-09 global recession did not show a corresponding rise in aggregate price level.

Aisen, and Veiga (2006) attempted empirical determination of the causes of worldwide diversity of inflation volatility using the fixed effects estimator on a sample covering around 100 countries analysed from 1975 to 1999. The findings showed that lower economic freedom; higher degrees of political instability, ideological polarisation, and fragmentation of the political system generated more volatile inflation rates. Lim and Sek (2015) examined factors affecting inflation in two groups of 28 countries classified into high inflation and low inflation using annual data from 1970 to 2011. An Error Correction Model based on the Autoregressive Distributed Lag (ARDL) modelling technique was used to explain the short-run and long-run impacts of each variable on inflation. The results, respectively, showed that GDP growth and imports of goods and services have significant long-run impact on inflation in low inflation countries. The results also indicated that money supply, national expenditure and GDP growth are the determinants of inflation which imposed long-run impact on inflation in high inflation countries. However, none of the variables was found to be significant determinants in high inflation countries in the short-run. On the contrary, money supply, imports of goods and services and GDP growth had significant relationship with inflation in low inflation countries. These findings supported the post Keynesians stance on inflation determinants.

Philipp and Rother (2004) examined the impact of discretionary fiscal policies on inflation volatility. The results revealed that volatility in discretionary fiscal policies has contributed to inflation volatility in a range of OECD countries between 1967 and 2001. Similar results were obtained for inflation uncertainty as measured by conditional variances derived from country-specific GARCH models. Regarding the size of the impact, an increase in discretionary fiscal policy volatility by one standard deviation is estimated to raise unconditional inflation volatility by some 10 per cent and conditional inflation uncertainty by up to 17 per cent. These values, computed at the mean values across countries, suggested that individual country effects could be even larger.

In view of the realisation that drivers of inflation are not restricted and country-specific, many country-specific data investigations have been conducted in Nigeria. Doyin and Ikechukwu (2013) used quarterly time series data for the period spanning 1970 to 2011, the autoregressive distributed lag (ARDL) modeling shows that inflation is not always and everywhere a monetary phenomenon in the case of Nigeria. This has raised serious doubt on the continuous use of monetary policy tool to achieve price stability in Nigeria. Adenuga et al. (2012) employ annual data from 1970-2009 using ordinary least

squares (OLS) to conclude that inflation is not a purely monetary phenomenon in Nigeria. However, the study indicated that the monetary variable significantly explains inflation in Nigeria. The study by Mbutor (2014) revealed that the impulse response function from Vector Error correction technique showed a persistent positive relationship between inflation and money supply while the variance decomposition indicated that money supply accounts for up to 34.5 per cent of aggregate price changes.

Table 1: Empirical Findings on Changes in MS and Inflation Relationship in Nigeria

Author(s)	Techniques	Scope	Relevant Findings	Inference
Adenuga et al. (2012).	OLS	1970-2009	Inflation is not a purely monetary phenomenon in Nigeria but significantly explains inflation in Nigeria	Significant
Doyin, S. & Ikechukwu, K. (2013)	ARDL	1970-2011	inflation is not a monetary phenomenon in Nigeria	Insignificant
Mbutor (2014)	VECM	1970-2012	money supply accounts for up to 34.5 per cent of aggregate price changes	Significant
Gatawa et. al., (2013).	VECM & GC	1973-2013	no causality between MS and infla tion in Nigeria	Insignificant
Tule et al. (2015)	VAR & variants of OLS	1982q1-2012q4	Weakening relationship between growth in monetary aggregates and inflation	Weakening relationship
Chuba (2015)	VAR	2000:1-2013:4	the impact of the change in MS is not transmitted to inflation in Nigeria	Insignificant
Jakada (2015)	VECM & GC	1970-2012	confirms the long-run significant and positive relationship	Significant
Alexander (2015)	VAR	1986-2011	MS has a long-run influence on inflation rate in Nigeria	Significant
Ifionu & Akinpelumi (2015)	O.L.S., GC & integration	1981-2013	Inflation has an inverse significance with MS	Inverse Relationship
Amassoma et al. (2018A)	VECM & GC	1970 -2016	no causality between MS and infla tion in Nigeria	Insignificant
Amassoma et al. (2018B)	ADLECM	1970-016	money supply does not influence inflation in the long and short-run	Insignificant
Udoh & Anietie (2018)	Predictive model	1995-2016	MS is significant in predicting future inflation rates in Nigeria	Significant
Bayo (2011)		1981 2003	MS significantly and positively impacted on the rate of inflation in Nigeria during the period	Significant
Idisebara (2019)	OLS	1985 to 2016	broad money supply does not have any significant impact on inflation	Insignificant

Note: MS = Money supply; GC = Granger causality; ADLEM = Autoregressive Dynamic Error Correction Mode; OLS = Ordinary least square; VECM = Vector error correction model

Motivated by the perceived weakening relationship between money and inflation, Tule et al. (2015) employed several econometric techniques including Vector Auto regressive (VAR) model and three variants of OLS to analyse data covering 1982q1 to 2012q4. While the entire sample and the first sub sample covering 1982q1 to 1996q4 suggested that money supply bears a long-run positive relationship with inflation, the second sub sample covering 1996q1 to 2012q4 indicated insignificant relationship between the two variables. The evidence of eventual weakening in the relationship between growth in monetary aggregates and inflation was attributed to developments of new products and assets classes in the Nigerian financial system that may be affecting demand for money.

Table 1 reveals that several other research findings have been reported on the subject matter in Nigeria. The research outcomes are, however, replete with mixed empirical findings, making reasonable conclusions difficult. Reviews of literature so far confirm the absence of theoretical and empirical consensus that inflation is always and everywhere a monetary phenomenon. This theoretical and empirical divergence of monetary effects on price level changes has raised uncertainties over the efficacy of monetary policy in the country. These reservations notwithstanding, the monetary authority has persisted on the use of monetary targeting as inflation management tool. This is a motivation for further investigation.

III.1 Model Variables and Theoretical Interrelations with Inflation

The failure of existing policy measures to tame inflation in Nigeria over time has raised doubts over the correlation between money supply growth and price changes in the Nigerian economy. This uncertainty necessitates the search, not only to investigate this relationship but, for other significant dynamics of price level changes in the economy. Given the complexity of the Nigerian economy, this study's model combines the monetary, fiscal and structural factors. Specifically, the model employed changes in money supply, exchange rate, fiscal budget, past inflation, monetary policy rate, import, fuel pump price, household income, global oil prices and gross domestic product (GDP) to address the research problem.

Table 2: Definition of Model Variables

Variable	Description	Expected Effect	Explanation
M2	Money supply	+	When there is a change in the supply of money, there is a proportional change in the price level (Friedman, 1963)
CPI	Consumer price Index		The dependent variable as a measure of price level changes
MPR	Monetary policy rate	+/-	The official interest rate of the monetary authority drives other interest rates in the economy (Kelilume, 2014).
FP	Fiscal policy	+/-	macroeconomic policy tool for adjusting aggregate demand by using either government spending or taxation (Agba & Khan, 2006; Ishaq & Mohsin, 2015 and Easterly & Schmidt-Hebbel, 1993)
HHC	Household income	+/-	household consumption, referred to as the "shadow of unemployment" (Campos & Reggio, 2014: 10), positively affected price increases changes (McGranahan, 2008)
GOP	Global oil prices	+/-	the relationship between oil price and inflation in Nigeria is very strong (Igberaese, 2013 and Tule et al., 2018)
GDP	Gross domestic product	+/-	inflationary pressures increase as aggregate demand in an economy expands, and vice versa
FPP	Fuel pump price	+	fuel pump price effect is passed to consumers directly (Nwosu, 2008; Ogundipe et al., 2014 and Eregha et al., 2015)
IMP	Imports	+	import prices significantly explain inflation patterns in a globalised economy (Corrigan, 2005; Hamilton, 2012)
IE	Inflation expectation	+	Past inflation exhibits a strong degree of inertia (Bawa et al., 2016; Asekunowo, 2016)

III.2 The Model Specifications, Diagnostic Tests and Estimations

The model data spanned from 2005q1 to 2017q4. The dataset comprises of consumer price index (CPI), fiscal balance (FB), import (IMP), household income (HHC) and GDP entered the model in log forms while M_2 growth rate ($M2\Delta$),

lagged inflation (LIN), exchange rate (EXR), fuel pump price (FPP), MPR and global oil price (GOP) were introduced in their cardinal forms as rate/prices. The dependent variable, CPI, and M2Δ, FB, LIN, EXR, IMP, FPP, HHC and MPR were entered as endogenous independent variables. The GOP and GDP variables were introduced as exogenous variables for control purposes.

Table 1 presents the results of unit root tests for all the variables. The result shows that CPI, M2Δ and FB are stationary at level [I(0)] while exchange rate, import, inflation expectation (lagged inflation), fuel pump price, household consumption, monetary policy rate, global oil price and GDP are non-stationary variables integrated at I(1).

Table 3: Unit Root Test Results

	With Intercept and Trend						With Intercept Only					
	Augmented Dickey-Fuller (ADF)			Phillips-Perron (PP)			Augmented Dickey-Fuller (ADF)			Phillips-Perron (PP)		
Variables	Level	1st Diff	Decision	Level	1st Diff	Decision	Level	1st Diff	Decision	Level	1st Diff	Decision
LIN	0.3238	0.0000	I(1)	0.3238	0.0000	1(1)	0.1195	0.0000	1(1)	0.1113	0.0000	1(1)
LFB	0.0000		1(0)	0.0000	0.0001	1(0)	0.0000		1(0)	0.0000		1(0)
LIMP	0.0740	0.0000	I(1)	0.1121	0.0001	1(1)	0.0697	0.0000	1(1)	0.0323		1(0)
LHHC	0.2374	0.0000	I(1)	0.3428	0.0001	1(1)	0.9952	0.0000	1(1)	0.9999	0.0000	1(1)
GOP	0.3077	0.0001	1(1)	0.5551	0.0010	1(1)	0.2383	0.0002	1(0)	0.2385	0.0002	1(1)
M2Δ	0.0000		I(0)	0.0000	0.0000	I(0)	0.0000		I(0)	0.0000		I(0)
EXR	0.6272	0.0027	1(1)	0.8196	0.0033	1(1)	0.9468	0.0006	1(0)	0.9468	0.0006	1(1)
LCPI	0.0251		1(0)	0.3784	0.0000	1(1)	0.9967	0.4517	1(2)	1.0000	0.0000	1(1)
MPR	0.4971	0.0018	I(1)	0.6988	0.0024	1(1)	0.4000	0.0003	1(1)	0.5025	0.0004	1(1)
LGDP	0.9540	0.0223	1(1)	0.3940	0.0000	1(1)	0.0601	0.1096	1(2)	0.0078		1(1)
FPP	0.1802	0.0000	I(1)	0.1714	0.0000	I(1)	0.8944	0.0000	I(1)	0.9138	0.0000	1(0)

The ARDL co-integration approach is a suitable alternative for estimating the short- and long-run effects of the mixed order of integrations because it could be used regardless of whether the underlying variables are I(0), I(1) or fractionally integrated. The ARDL technique also minimises the endogeneity problems and all the variables are assumed to be endogenous. In addition, not only that the ARDL does not generally require knowledge of the order of integration of variables, the long-run and short-run variables are estimated simultaneously, thereby removing problems associated with omitted variables and autocorrelation. The ARDL co-integration approach involves just a single-equation set-up, making it simple to implement and interpret. According to Pesaran and Shin (1999; 2001), the augmented ARDL $\left(p, q_1, q_2, ..., q_k\right)$ can be written as follows:

$$\alpha\ (L, p)y_t = \alpha_0 + \sum_{i=1}^{k} \beta_i\ (L, q_i)x_{i,t} + \varepsilon_t \quad (1)$$

Where: α_0 is a constant, y_t denotes the dependent variable, L is a lag operator, $x_{i,t}$ is the vector of regressors (where i = 1, 2,…, k) and $t\underline{e}$ is the disturbance term. In the long-run, $y_t = y_t{-}1 = ... = y_{t-q}$ and $x_{it}, = x_{i,t-1} = ... xi,t{-}q$ = The $xi,t{-}q$ term denotes q^{th} lag of the i^{th} variable. The long-run equation can be written as follows:

$$y_t = \alpha + \sum_{i=1}^{k} \beta_i x_i + \varepsilon_t \quad (2)$$

The lag order selected based on Akaike Information Criterion (AIC) for the vector autoregressive (VAR) model was 3. The co-integration vector was normalised to the price level change with restricted linear trend in VAR. To verify the performance of the estimated model, the diagnostic tests associated with the model are examined for serial correlation, functional form, non-normality and heteroscedasticity. In addition, CUSUM (Cumulative Sum) and CUSUMSQ (CUSUM of Squares) of recursive residuals stability tests proposed by Brown *et al*. (1975) are conducted.

III.3 Data Presentations and Analysis

The pretest diagnoses demonstrate that the diagnostic tests fulfil the ideal conditions in an ARDL model. These tests include the absence of serial correlation (Table 2) which is essential for validation of the regression results (Loayza & Ranciere, 2006) and heteroscedasticity (Table 3), an adequate functional form test (Table 4) and adjustments for dynamic regressors (Appendix 1). All the tests far exceed the 0.05 value, confirming that the error term is not correlated.

Table 2: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.887424	Prob. F(2,21)	0.4266
Obs*R-squared	3.818577	Prob. Chi-Square(2)	0.1482

Table 3: Heteroskedasticity Test: ARCH

F-statistic	1.029966	Prob. F(1,46)	0.3155
Obs*R-squared	1.051210	Prob. Chi-Square(1)	0.3052

Table 4: Ramsey RESET Test

	Value	df	Probability
t-statistic	1.318514	22	0.2009
F-statistic	1.738479	(1, 22)	0.2009

In addition to the diagnostic tests on the error term, the normality test (Appendix 2), the Recursive Coefficients stability test (Appendix 3) and the Cumulative Sum of Squares of Recursive Residuals (Figure III) were also examined to test the specification fit. The graphs corresponding to each model (Appendix 4) demonstrate that, at 5 per cent level of significance in the critical bounds, structural breaks are absent, and models are correctly specified. In the interpretation of the model coefficients, the results of long and short-run effects are treated separately.

Table 5: ARDL Bounds Test

Test Statistic	Value	k
F-statistic	10.03754	8
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.13	3.09
5%	2.38	3.41
2.5%	2.62	3.7
1%	2.93	4.06

The null hypothesis of the F-test (10.04) exceeds the upper critical bound (4.06) evaluated at 1 per cent (Table 5), thereby confirming that a long-run relationship exists and the ARDL model can be estimated. The advantage of ARDL model is the provision of short- and long-term outcomes to facilitate optimal policy formulation and implementation. The terms in parenthesis are the lags of the variables that define the CPI in terms of the structure of lags. Thus, the selected lags for the model were 2, 2, 1, 3, 3, 0, 0, 1, and 2 for CPI, M2Δ, FB, LIN, EXR, IMP, FPP, HHC and MPR, respectively.

Table 6 is the output of the ARDL co-integrating (short-) and long-run results. The lagged error correction term (ECT-1) in the short-run has a coefficient of -1.1. The coefficient falls within the dynamically stable range as the model requires that "the existence of a long-run relationship (dynamic stability) and that the coefficient on the error-correction term be negative and not lower than -2 (that is, within the unit circle)" (Loayza & Ranciere, 2005: 11). The coefficient of -1.1 implies that the adjustment takes place instantaneous and completely within the quarter (Nkoro & Uko, 2016: 85).

However, instead of monotonically converging to the equilibrium path directly, the error correction process fluctuates around the long-run value in a dampening manner, but once this process is completed, convergence to the equilibrium path is rapid (Narayan & Smyth, 2006: 339). The highly significant error correction term further confirms the existence of a stable long-run relationship (Shittu *et al.,* 2012). In general, the results show that most of the coefficients exhibit the expected signs and are statistically significant at 10 per cent confidence level.

Table 6: ARDL Co-integrating and Long-runForm

Co-integrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPI(-1))	0.338047	0.143180	2.360998	0.0271
D(M2Δ)	0.000667	0.000261	2.561105	0.0175
D(M2Δ(-1))	-0.000146	0.000230	-0.635187	0.5316
D(LFB)	-0.000040	0.001459	-0.027509	0.9783
D(LIN)	0.000487	0.000966	0.503426	0.6195
D(LIN(-1))	-0.003707	0.000939	-3.947170	0.0006
D(LIN(-2))	-0.004066	0.000807	-5.035444	0.0000
D(EXR)	0.000256	0.000110	2.314468	0.0299
D(EXR(-1))	-0.000010	0.000121	-0.082984	0.9346
D(EXR(-2))	-0.000300	0.000126	-2.392908	0.0253
LIMP	0.003441	0.005909	0.582233	0.5661
FPP	-0.000090	0.000088	-1.014697	0.3208
D(LHHC)	0.001644	0.021716	0.075706	0.9403
D(MPR)	-0.000551	0.002375	-0.232218	0.8184
D(MPR(-1))	-0.000464	0.002371	-0.195767	0.8465
D(GOP)	0.000342	0.000153	2.239132	0.0351
D(LGDP)	-0.003126	0.038841	-0.080476	0.9366
C	5.428467	0.729327	7.443115	0.0000
Co-intEq(-1)	-1.147456	0.146974	-7.807223	0.0000
Long-run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2Δ	0.000817	0.000561	1.457796	0.1584
LFB	-0.005403	0.003025	-1.786116	0.0873
LIN	0.006226	0.000663	9.391966	0.0000
EXR	0.000164	0.000070	2.332810	0.0288
LIMP	0.034205	0.008642	3.957905	0.0006
FPP	0.000356	0.000179	1.992117	0.0584
LHHC	-0.059620	0.021754	-2.740663	0.0116
MPR	0.002318	0.000834	2.778209	0.0107
GOP	0.000272	0.000099	2.746572	0.0115
LGDP	-0.018092	0.035767	-0.505832	0.6178
@TREND	0.026035	0.001587	16.406802	0.0000

III.4 Short-Run and Long-Run ARDL Results and Discussions

Both the long- and short-run results are discussed due to their relevance to monetary policy decisions. The empirical outcome revealed that M2Δ has an instantaneous positive statistical significance with CPI in the quarter which the change occurs. However, the positive impact fizzles out permanently. This implies that inherent structural rigidities in the economy (Sanusi, 2002) produce unfavourable "supply shocks" which constitute binding constraints to the traditional significant long-run relationship between money supply and price changes (Corrigan, 2005). The finding confirms Myrdal's (1959) argument against applying the highly aggregative demand-supply model for explaining inflation in developing countries.

Fiscal balance is negatively significant in the long-run at 10 per cent confidence level. Nigeria's fiscal deficits are substantially financed through Treasury-Bills (TBs) which do not create new money in the process (Agba & Khan, 2006) and foreign debts leading to appreciation of the real exchange rate (Easterly & Schmidt-Hebbel, 1993). Past inflation has high significant positive impact on current inflation in the short-and long-runs. The rationality of this behaviour may be attributed to the persistent self-reinforcing growing power of inflation (Friedman, 1975). It also agrees with Bawa et al. (2016) and Asekunowo (2016) that, in Nigeria, the CPI exhibits a strong degree of inertia.

Exchange rate has a positive instantaneous significance on price level which fizzles out in the next quarter, but eventually become significant in the long-run. This result confirms import price pass-through to importing destinations (Hamilton, 2012) and may be explained by the realities that, in Nigeria, structural rigidities impose constraints on stable price level due to low industrialisation and technological developments (Conavese, 1982). In addition, structural shortcoming constrains substitution possibilities between consumption and production sectors, hence, the excessive import leading to the consequent exchange rate pass-through (Oise, 2015).

Fuel pump prices have short-run insignificant negative impact on prices level changes but becomes positively significant in the long-run. This is in congruence with findings by Nwosu (2008) and Eregha et al. (2015). This is explained by the weight and impact of FPP in the CPI basket in Nigeria [the direct impact of FPP through Housing, Water, Electricity, Gas (18.10 per cent) and Transport (4.24 per cent) together account for 22.34 per cent of the total headline inflation (CBN, 2010)]. Household income has a high negative significance in the long-run. This is in line with the *a priori* expectation that it takes some time for the adjustment to be significant. However, once the change in household income becomes

persistent, the negative impact on price level changes becomes significant in the long-run.

The MPR assumes a positive significant impact on price level changes in the long-run. This is attributed to the persistent hawkish pattern of MPR during the sample period. This justifies post Keynesian theory that economic agents make decisions that eventually perpetuate inflation in the process of determining optimal level of employment (Eichner, 2004; King, 2002).

Changes in global oil prices depict short- and long-run significant positive impact on changes in price level. Global oil price substantially affects budgetary allocations and foreign earnings (Igberaese, 2013), while the monetisation of the receipts from oil proceeds by the apex bank creates liquidity in the economy (Adedipe, 2004). Movements in global oil prices, therefore, intermingled with critical macroeconomic variables such as fiscal deficits and exchange rate. Thus, changes in oil prices are bound to have significant effect on inflation in the Nigerian economy.

IV. Conclusion

This study was motivated by the need to examine the significance of the proposition that "inflation is always and everywhere a monetary phenomenon". Findings of the study showed that there is no sufficient statistical evidence alluding to the belief that "inflation is always and everywhere a monetary phenomenon" is applicable to the Nigerian economy. The findings also showed that non-monetary factors: inflation expectation, import, global oil price, exchange rate, fuel pump price and monetary policy significantly induce inflationary pressure in Nigeria. Conversely, household income (the shadow of unemployment) significantly dampens inflation while fiscal budget and GDP moderate inflation, albeit insignificantly.

Overall, the findings submit to dominance of structural and fiscal dynamics in the inflation equation and suboptimal management in Nigeria. This suggests the articulation and functional integration of monetary policy and non-monetary policy measures as an imperative to achieving sustainable price stability in the economy.

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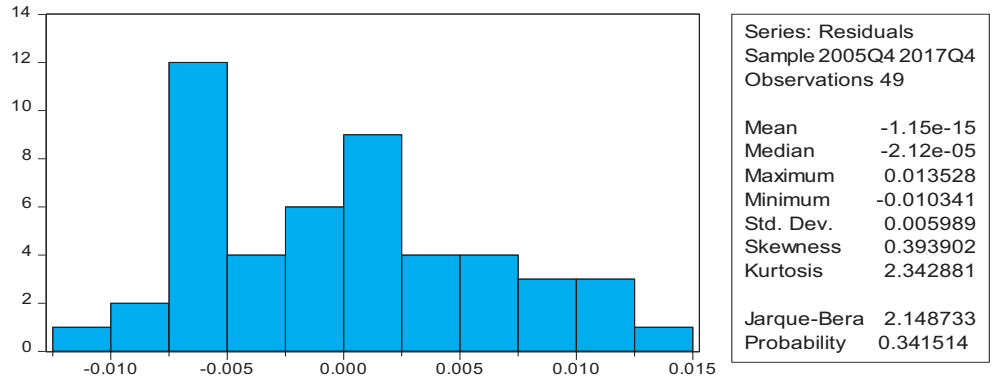
Appendices

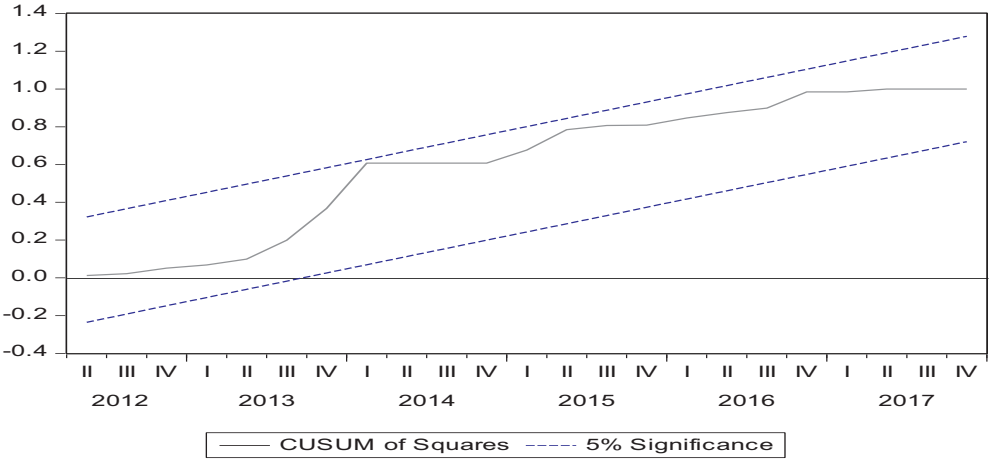
Appendix 1: Q-Statistics Profanities

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. |*. |	. |*. |	1	0.147	0.147	1.1222	0.289
. | . |	. | . |	2	0.031	0.010	1.1738	0.556
. | . |	. | . |	3	0.056	0.051	1.3444	0.719
. | . |	. | . |	4	-0.025	-0.042	1.3802	0.848
. |*. |	. |*. |	5	0.102	0.113	1.9752	0.853
.*| . |	**| . |	6	-0.175	-0.217	3.7504	0.710
. |*. |	. |*. |	7	0.120	0.202	4.6045	0.708
. | . |	.*| . |	8	-0.041	-0.131	4.7049	0.789
.*| . |	. | . |	9	-0.110	-0.039	5.4606	0.792
. |*. |	. |*. |	10	0.091	0.075	5.9897	0.816
. |*. |	. |*. |	11	0.101	0.159	6.6656	0.825
. |** |	. |*. |	12	0.305	0.208	12.943	0.373
. | . |	. | . |	13	0.066	0.040	13.245	0.429
.*| . |	.*| . |	14	-0.106	-0.190	14.050	0.446
. | . |	.*| . |	15	-0.044	-0.071	14.194	0.511
.*| . |	.*| . |	16	-0.141	-0.110	15.696	0.474
. | . |	. | . |	17	0.032	0.063	15.776	0.540
. | . |	. | . |	18	-0.061	-0.020	16.077	0.587
.*| . |	.*| . |	19	-0.095	-0.073	16.827	0.602
. | . |	. |*. |	20	0.062	0.094	17.155	0.643

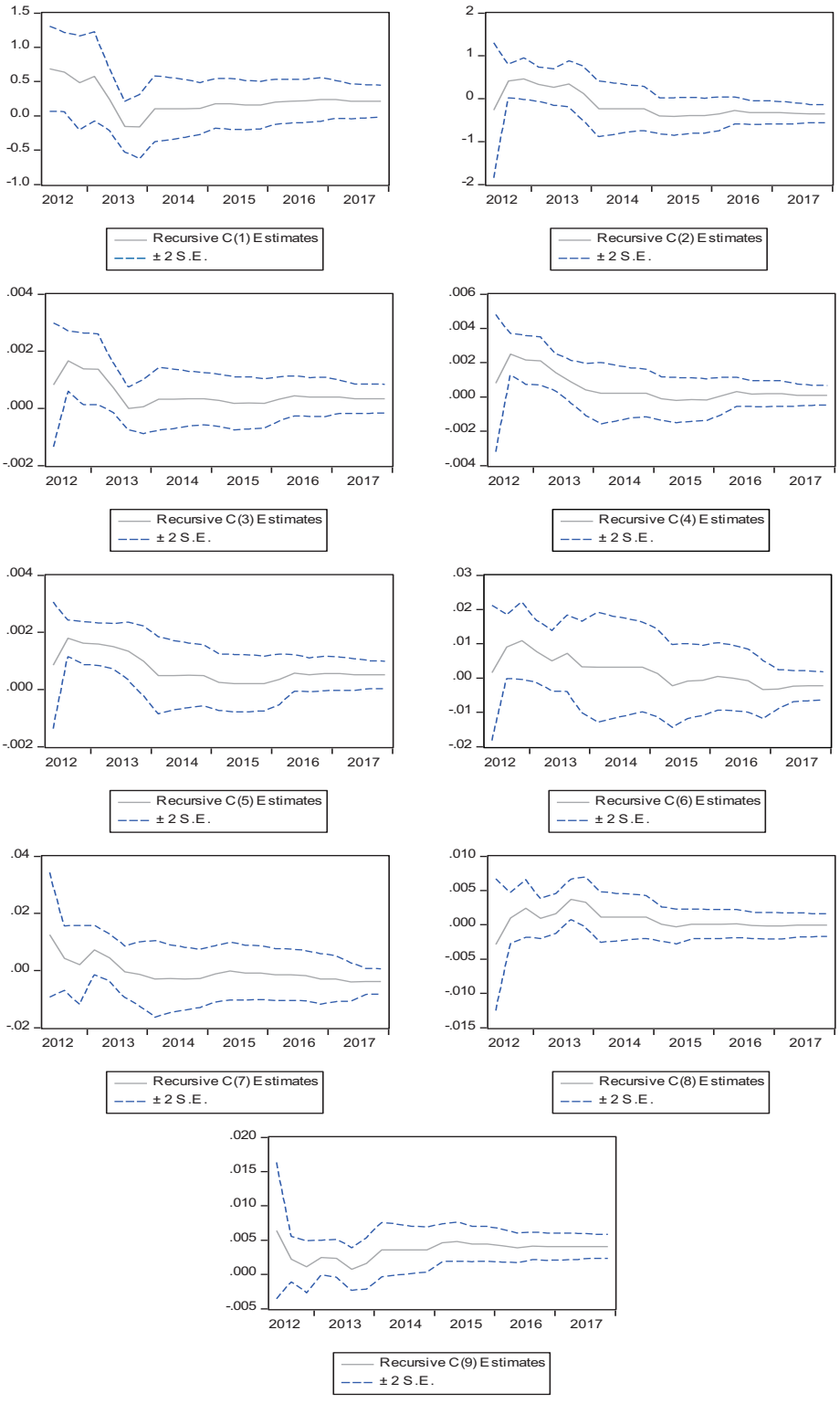
Appendix 2: Normality Test

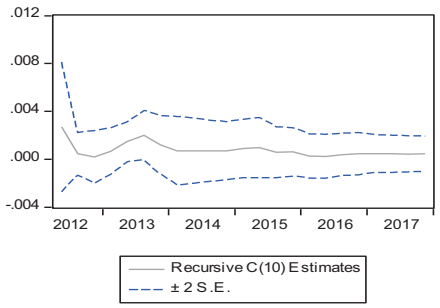


Appendix 3: CUSUM of Squares



Appendix 4: CUSUM of Coefficients

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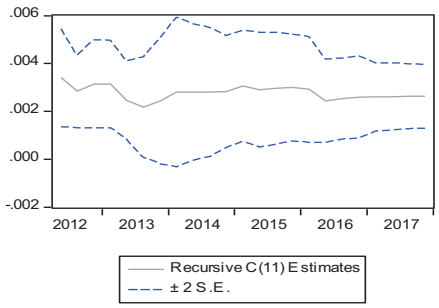
Recursive C(10) Estimates
± 2 S.E.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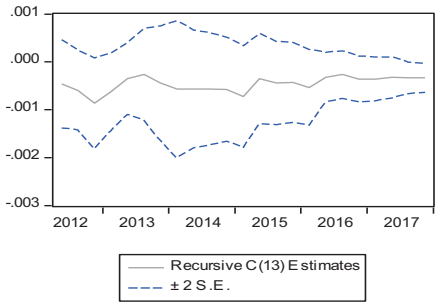
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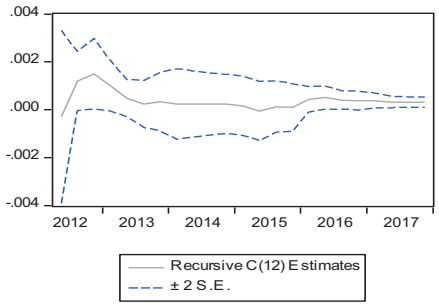
± 2 S.E.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Recursive C(12) Estimates
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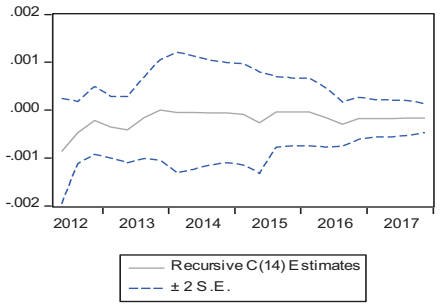
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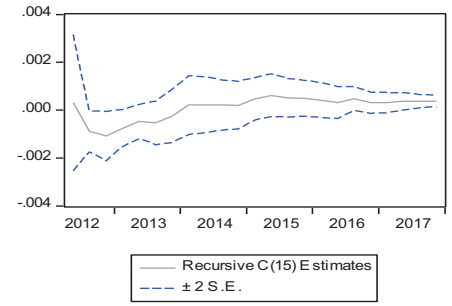
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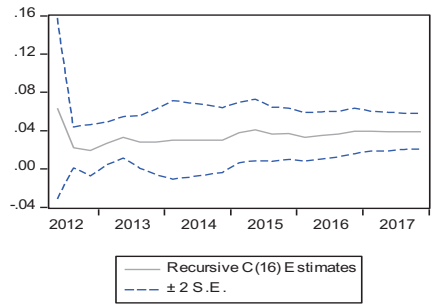
± 2 S.E.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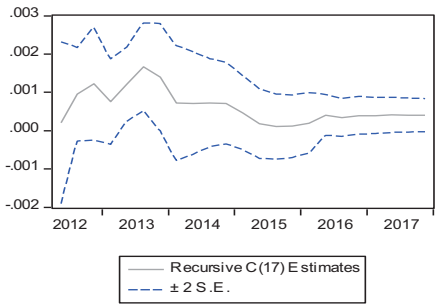
± 2 S.E.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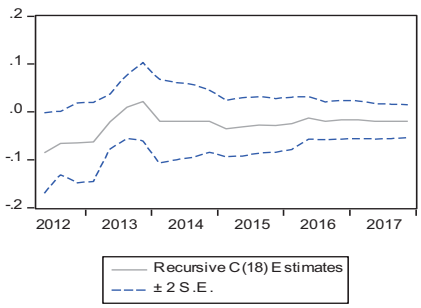
± 2 S.E.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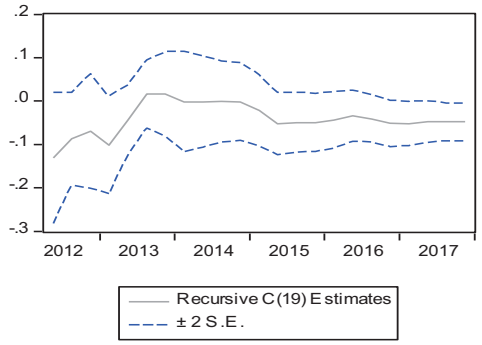
Recursive C(18) Estimates
± 2 S.E.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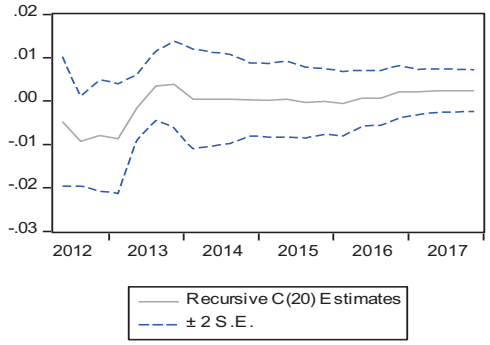
± 2 S.E.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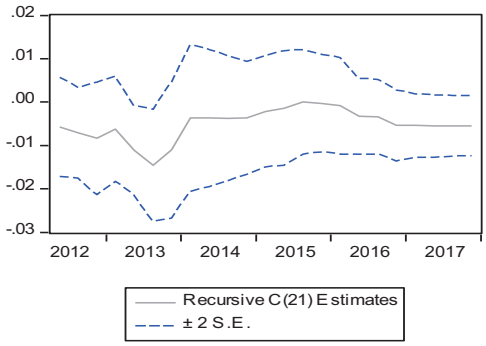
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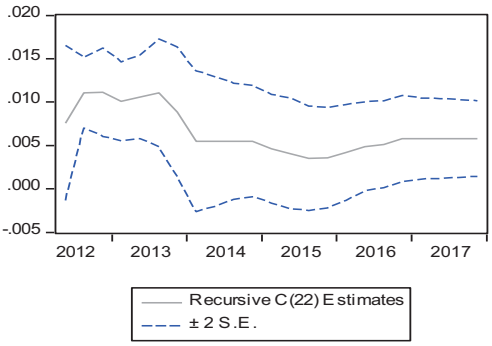
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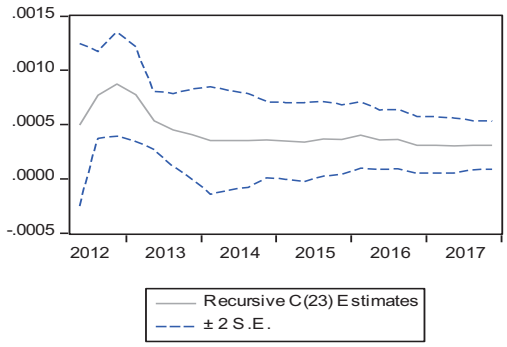
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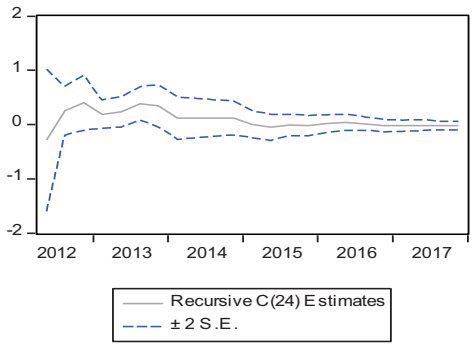
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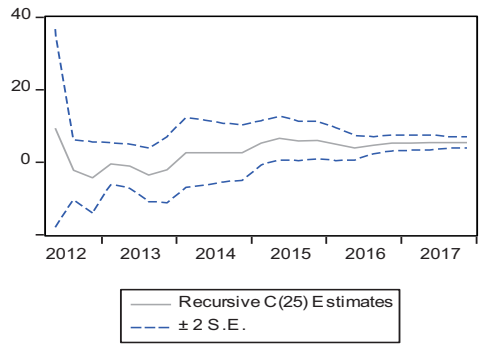
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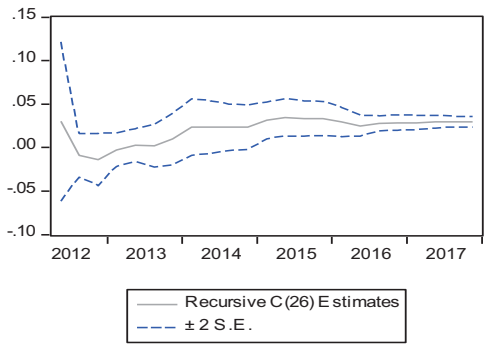
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