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ARTICLE

Does Inflation Expectation Matter for Inflation in Nigeria?

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Abstract

This study examines the role of inflation expectations in shaping Nigeria's inflation dynamics, recognizing their critical effect on macroeconomic stability. Despite the importance of expectations in actual inflation, empirical evidence on their impact in Nigeria remains limited. Using quarterly data from 2010Q1 to 2024Q1, this paper employs a Vector Autoregressive (VAR) and Structural VAR (SVAR) framework to examine both forward-looking expectations (proxied by Google Trends) and backward-looking expectations (proxied by lagged inflation). The results indicate that forward-looking expectations exert a minimal and statistically insignificant effect on actual inflation, while lagged inflation expectations exhibit strong persistence, explaining approximately 60–65% of the variance in inflation. Exchange rate shocks emerge as the second most significant driver (15–25%), underscoring Nigeria's vulnerability to currency fluctuations. In contrast, monetary policy rate shocks contribute only 5–8%, reflecting weak policy transmission. Impulse response analysis further shows that forward-looking expectations reduce inflation, whereas backward-looking expectations amplify it. These findings highlight that inflation in Nigeria is predominantly shaped by adaptive, backward-looking behavior rather than forward-looking expectations. The paper recommends strengthening exchange rate stability, enhancing the credibility and communication of monetary policy, and promoting a gradual shift toward forward-looking expectations to improve inflation management and anchor price stability.

Keywords: Inflation expectations, Nigeria, VAR, SVAR, Exchange rate, Monetary policy, Inflation persistence
JEL Classification: E31, E52
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1. Introduction

It is an innate attribute that we form expectations or hold views about the future as humans. These expectations are informed by experience and emotions and expressed via decisions or actions. As in the words of Plato "Each man possesses opinions about the future, which go by the general name of expectations". The importance of expectations lies in their strong impact on the current decisions or choices of economic agents (households and firms) on prices and the overall level of economic activity *(**Schafer, 2022**)*. Expectations influence the time path of economic activity even though it can also be argued that the time path of economic activity also influences expectations.

Inflation expectations are views economic agents hold about the path of prices in the future. The view that prices will increase more rapidly is usually reflected in higher inflation expectations, just as will be the case in low inflation expectations when the view is that price increases will slow in the future. Inflation expectations are important in inflation analysis. First is that prices are determined by the forces of demand and supply, which stem from the decisions of households and firms, also affected by their expectations of future price development. Second is that inflation expectations affect actual inflation, and which has been empirically established (**Clark and Davig, 1999**; **Chen, 2019**; **Rudd, 2021**). High inflation is detrimental to welfare, as a rising inflation rate lowers real income. Most central banks are required to ensure that prices are stable, one of which is the general price level. Given the role of inflation expectations in the inflation path, anchoring expectations is one important policy requirement for managing inflation dynamics. As **Bernanke (2013)** states, “expectations matter so much that a central bank may be able to help make policy more effective by working to shape those expectations”.

Fuhrer (2009) defines inflation persistence as the rate of change of the price level that tends to remain constant, in the absence of an economic shock, to move it from the current level. Though inflation persistence is seen as backward-looking, capturing the trend and movement of inflation over time, inflation expectation, on the other hand, is forward-looking, based on the perception of what inflation will be in the future. The two concepts are related because persistent inflation can shape inflation expectations. **Pfajfar and Žakelj (2014)** are of the view that expectations have become very important in modern macro-economic theory, such that expectations from households and firms are now key consideration of central banks in monetary policy decision as they signal inflationary risks.

While existing studies have extensively analyzed the determinants of inflation in Nigeria, most have either focused on macroeconomic variables such as oil prices, exchange rates, and fiscal deficits or adopted traditional models that overlook the role of inflation expectations. Although a few empirical works (e.g., **Shaibu and Osamwonyi, 2020**; **Agu and Nyatanga, 2021**) have acknowledged the influence of expectations, they often rely on indirect proxies or omit explicit modeling of expectations altogether. Moreover, very few studies in the Nigerian context utilize survey-based or market-implied measures of inflation expectations, despite their proven relevance in inflation forecasting in advanced economies. This gap is significant because inflation expectations, when properly measured can offer forward-looking insights that help central banks anchor inflation and improve policy effectiveness. This study therefore wishes to contribute by integrating both survey-based expectations (using Google Trends) and market-implied expectations (using lagged inflation values) into a model of inflation dynamics in Nigeria. This we believe offers improved understanding of how expectations shape inflation in a developing economy with structural rigidities and policy credibility challenges.

To achieve this, the rest of the paper is organised into 4 parts. Following the introduction is the synopsis of theoretical and empirical literature on the subject and some stylized facts in section 2. This is followed by the data and model for the empirical analysis in section 3, while in section 4, the paper presents the estimation results and analyses. Conclusion and policy suggestions are presented in section 5.

2. Literature

2.1 Theoretical Literature

Discussion on expectations formation can be traced back to the philosophy of two great thinkers, Plato and Aristotle. The first saw human knowledge as a product of reasoning while the second saw it as a product of observation and experience. While the former is premised on abstraction, the latter is driven by realism **Shields (2016)**, however whether these sources of knowledge are parallel, is it sufficient enough to inform human action without the complement of the other remains debatable. It may be safer to argue that expectations formation of economic agents could be informed by both observation/experience and the application of reasoning.

Once beliefs and expectations are introduced into economics, as is surely reasonable, the policy results become indeterminate. Much depends on what people think the impact of the policy will be. This is to say that the success of the right policy may depend on the public’s expectations of its effects. No policy is construed as wrong in its design and intention or objective by the policymakers. The question then is why should the public have the wrong expectations?

According to **Baier (1986)** “Trust involves the belief that others will, so far as they can, look after our interests, that they will not take advantage or harm us.” Trust is induced by lack of certainty and is used to reduce uncertainty in anticipating the future. It is a bet on future contingent actions of others, and it is composed of several factors which include regularity, reliability, fairness, accountability and representativeness, amongst others (**Sztomka, 1996**). Therefore, to trust is to act as if the uncertain future actions of others were indeed certain, however, the violation of these expectations usually results in negative outcomes (**Lewis and Weigert, 1985**).

It has been argued that a high level of trust in the commitment and ability of a central bank to keep inflation close to target can anchor medium- to long-term inflation expectations on the target such that the public sees deviations from the target as temporary (**Christelis et al 2020**). Although empirical evidence is currently lacking, it has been recognized that understanding the relationship between trust and inflation expectations is highly relevant to policy.

Trust deficit weakens policy effectiveness in anchoring expectations. In other words, when the public, from experience or observation, believes that the policymakers’ actions do not follow the prescription of the policy, this can form the basis of wrong expectations by the public. It has also been posited that where trust is lacking, support for necessary reforms is difficult to mobilize, particularly where short-term sacrifices are involved, and long-term gains might be less tangible *(**OECD, 2013**)*. That inflation expectations feed into important household financial decisions has been documented in several studies. For instance, households are less likely to invest in long-term instruments but rather borrow through fixed rate when expecting higher inflation compared with when expecting low inflation, which implies that inflation expectations influence their investment choices/decisions (**Armantier et al 2015, Nagel, 2016**). It has also been found that higher inflation expectations increase household readiness to purchase durable goods (**D'Acunta et al 2016**).

But the effect of the so-called monetary policy tightening also depends on expectations. If reducing volume of cash available to businesses will make them less confident, they will spend less. However, if they mistrust the policy, they will spend more, especially when there is uncertainty around the stability of the exchange rate for a small open economy like Nigeria (**Skidelsky, 2015**)[1].

From the foregoing, inflation expectations are important in directing macroeconomic decisions of households and firms and here we attempt to empirically assess if inflation expectations (proxied by inflation expectation from a google trend and lag of inflation), influences actual inflation in Nigeria.

2.2 Empirical Literature

The findings of **Christelis et al (2020)**, in assessing ECB, found that higher trust in the Bank induces, on average, lower one-year-ahead inflation expectations. Similarly, higher trust contributes to lower individual uncertainty about the future price growth, suggesting a form of anchoring of inflation expectations. Empirical literature on inflation expectations is more pronounced in advanced economies. For instance, **Pesaran and Weale (2005)** provided a comprehensive review of alternative models for inflation expectations and their role in macroeconomic forecasting. Further, **Brissimis and Migiakis (2010)** tested the rational expectations hypothesis in inflation forecasts, while **Kikuchi and Nakazono (2022)** analyzed how households in Japan form inflation expectations using microdata evidence. In Africa, **Sibanda et al. (2015)** employed a VAR model to assess the influence of oil prices and exchange rates on inflation expectations in South Africa. Likewise, **Chattopadhyay et al. (2019)** applied a state-space model with a Kalman filter to estimate unobserved inflation expectations in India. A significant body of literature also links oil prices to inflation in Nigeria. **Agu and Nyatanga (2021)** investigated whether expected crude oil prices influence inflation in Nigeria using the ARDL approach and Bound testing. Their findings suggest that fluctuations in global oil prices significantly shape inflationary trends in the country. This aligns with broader empirical evidence suggesting that oil price shocks influence expectations, which in turn affect actual inflation.

Several studies have examined the dynamics of inflation in Nigeria, employing various econometric models to analyze its determinants and implications. Shaibu and **Osamwonyi (2020)** conducted a comparative analysis of inflation dynamics models in Nigeria, establishing a link between inflation expectations and actual inflation rates. Their study employed the ARDL and ARIMA models to assess inflation trends but did not incorporate survey-based inflation expectations. Similarly, **Shobande and Ibrahim (2018)** utilized the ARDL cointegration approach, ECM, and OLS methods to investigate the macroeconomic determinants of inflation in Nigeria between 1980 and 2015. Their findings emphasized the influence of oil price shocks and fiscal deficits on inflationary pressures. A related study by **Augustine et al. (2020)** applied VAR and ARDL models to examine the interplay between exchange rates, interest rates, and GDP in shaping Nigeria's inflationary trends.

Others have focused on inflation forecasting and structural trends. **Abubakar (2020)** estimated trend inflation in Nigeria using a moving average and stochastic volatility approach, highlighting inflation persistence without assessing inflation expectations. In another study, **John and Patrick (2016)** employed a Seasonal ARIMA model to forecast Nigeria's short-term inflation rates from 2000 to 2015, identifying seasonal fluctuations but omitting expectations-based inflation analysis. Earlier, **Moser (1994)** employed an error correction model to analyze the primary determinants of inflation in Nigeria, emphasizing monetary expansion, fiscal policies, and exchange rate devaluation, yet failing to incorporate inflation expectations as a predictive variable.

Odu, Aminu and Ado (2024), examined the impact of monetary policy communication on inflation expectations in Africa. They employed text mining techniques to analyze the monetary policy statements of six African Banks, and they found that a rising influence of sentiments in anchoring expectations during the COVID-19 pandemic era.

The reviewed empirical literature highlights the diverse methodological approaches employed in analyzing inflation dynamics in Nigeria. Several studies have assessed the determinants of inflation, yet limited works have employed inflation expectations using survey-based or market-implied measures. This study is a contribution to the growing body of knowledge using expectation-based models in understanding the dynamics of inflation in Nigeria. The inflation expectations used here are survey-based using google

[1] Trust level shape expectations which in turn informs response of economic agents and the eventual outcomes.

trend and market-implied measures using the lagged value of inflation.

2.3 Stylized facts

The plot of inflation versus inflation expectations over time reveals several important patterns. Actual inflation closely tracks expectations formed using lagged inflation values, suggesting that economic agents may largely rely on historical inflation trends to shape their outlook. This relationship appears relatively stable over the years, with both series moving in tandem and showing consistent levels.

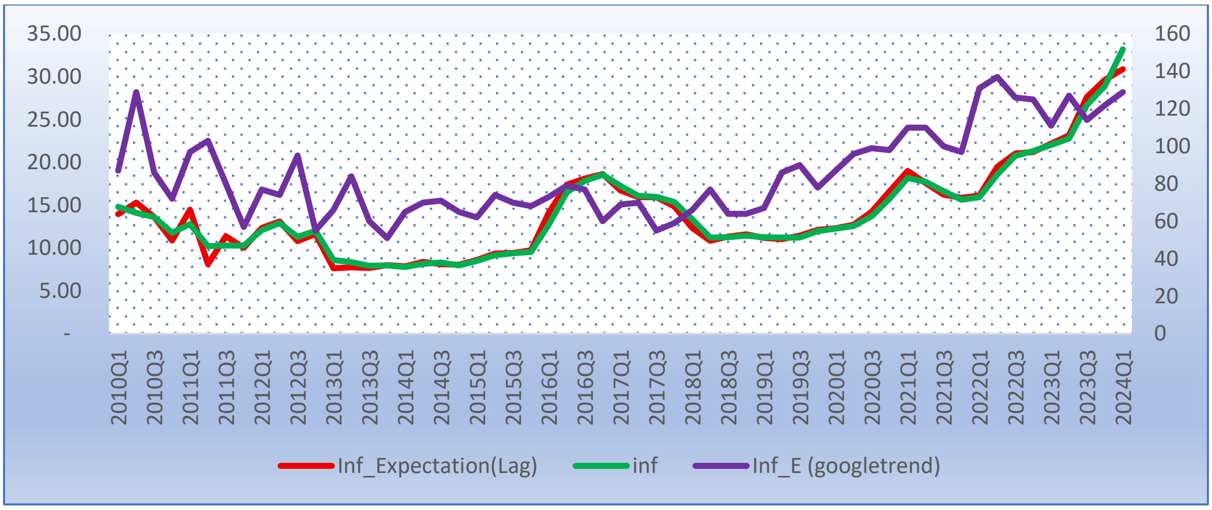


Figure 1: Inflation and inflation expectations trends

In contrast, inflation expectations derived from Google Trends data exhibit far more volatility and tend to deviate substantially from actual and lagged inflation. This suggests that public perception of inflation, as reflected in search activity, may be more reactive to shocks, uncertainty, or news cycles, rather than economic fundamentals alone. From 2020 onwards, there is a noticeable upward trend across all three series: actual inflation, lagged expectations, and those based on Google Trends. Also, the gap between actual inflation and expectations, as measured by Google Trends, widens considerably in this period, indicating that public concern about inflation may have exceeded the reality reflected in official data. This divergence points to the potential influence of global events, such as the COVID-19 pandemic and its aftermath, on inflation sentiment.

3. Data and Model

This study employs quarterly time series data covering the period from 2010Q1 to 2024Q1. Data for all the variables were obtained from the electronic database of the Central Bank of Nigeria.

On choice of proxies for inflation expectations, most appropriate proxies for inflation expectations are survey-based measures and market-based measures. Survey-based expectations are mostly used by monetary authorities for inflation forecasts and evaluation of the credibility of their inflation fighting policies. They provide direct insight into how different economic agents perceive inflation and capture heterogeneity in expectation, as well as provide an important link in the monetary policy transmission mechanism.

Market-based measures such as inflation-linked bond yields[2] or break-even inflation rate[3] are derived from financial market data, reflecting collective expectations of financial market participants. There is currently no available data on break-even inflation rate in Nigeria as the country does not issue inflation-protected bond.

The currently available survey-based measure in Nigeria is the Business Expectation Survey (BES), which is a national survey covering business entities in the 36 states and the Federal Capital Territory. The Central Bank of Nigeria (CBN) commenced the conduct of BES in the second Quarter of 2008 and has continued till date. The BES is a quarterly survey of business firms drawn from Business Establishment updated frames of the CBN and the National Bureau of Statistics (NBS). The survey generates qualitative

[2] That is, real yield on inflation-protected bond
[3] This is typically derived from the difference between nominal yields on a conventional bond and the real yield on an inflation-protected bond. It is the rate of inflation at which an investor is indifferent between holding a nominal bond and an inflation protected bond.

measures of percentage changes in selected business variables as indicators of general business conditions and tendencies.

A study by **Adamu (2015)** employed the BES to assess whether survey-based expectations mimic inflation in Nigeria. His findings showed that BES inflation index predicts inflation rate only between 5 to 20 per cent threshold, which corresponds with Nigeria inflation series covered by the study. The paper found a weak and statistically insignificant relationship between the BES indicators and inflation rate, amongst other selected macroeconomic indicators.

This study employed Google Trends as a proxy for inflation expectations as this is becoming increasingly common in economic research, especially when survey-based measures are limited or unavailable, as is often the case in developing countries **Choi, and Varian (2012)**.

To examine if inflation expectations matter for inflation in Nigeria, this work adopts **Sibanda et al. (2015)** VAR methodology but modified the model using python programming language, to estimate the model, and the SVAR was used as a casual inference. The general form of the VAR model of order *p* is specified as:

$$Y_t = A_i Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + \epsilon_t \tag{1}$$

where;

Y_t is a (5*1) vector of endogenous variables [real gross domestic product growth rate (*gdp*), exchange rate (*exr*), monetary policy rate (*mpr*), inflation expectation using google trend (*infegt*), and inflation expectation using lagged inflation (*infi*), which were used in different equations, and actual inflation (*inf*)].

A_i are (5*5) coefficient matrices for lag $i = 1, \dots, p$

ϵ_t is a (5*1) vector of white noise error terms.

Based on equation (1), we also estimated the Structural VAR, using the short run restriction and placed the shock based on the theory that inflation expectation responds to macro fundamentals. That is expectations depends on policy credibility and economic activity, which is propounded by **Muth (1961)**. He is of the view that expectations of individuals tend to be identical to the predictions of the relevant economic theory. In modern economics this theory is the fundamentals of the New Keynesian model, Philips curve and the monetary policy rule where inflation expectation is specified as forward looking.

The justification for the arrangement is that *gdp*, is not affected by any shocks, and output responds with lags to policy. *exr* responds only to gdp in our model, since export and import activities in the economy affects the level of reserve in the economy. *mpr* responds to *exr* and *gdp*, while Central bank set policies based on growth levels in the economy. Inflation expectations showed to respond to *gdp*, *exr*, and *mpr* because people make projections based on initial macro fundamentals. *Inf* on the other hand responds to all variables, this is because inflation shows early response to shocks. This analysis was done using Eviews.

The identification structure of the SVAR model used in this study is informed by theory and empirical precedent. GDP is considered here to be contemporaneously exogenous to other variables, consistent with models where output responds to policy with lags (**Woodford, 2003**). The exchange rate responds to GDP through trade and capital flows, aligning with the balance of payments theory and the Mundell-Fleming model. Monetary policy (MPR) is ordered after GDP and exchange rate, reflecting central banks' response functions based on output gaps and exchange rate pressures (**Taylor, 1993; Svensson, 1997**). Inflation expectations are formed based on observed macro fundamentals such as GDP, exchange rates, and policy rates, in line with rational expectations theory (**Muth, 1961**). Finally, inflation is assumed to respond contemporaneously to all variables, as it is directly affected by shocks to output, policy, currency, and expectations, consistent with the New Keynesian Phillips Curve (**Galí, 2008**).

The A matrix of the structural var using the short run restrictions, by imposing zero restrictions on some elements of the A matrix. The matrix would look like:

$$A_1 = \begin{bmatrix} a_{11} & 0 & 0 & 0 & 0 \\ a_{21} & a_{22} & 0 & 0 & 0 \\ a_{31} & a_{32} & a_{33} & 0 & 0 \\ a_{41} & a_{42} & a_{43} & a_{44} & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} \end{bmatrix} \begin{bmatrix} dgdp \\ dexr \\ dmpr \\ dinflegt \\ dinf \end{bmatrix} \begin{bmatrix} shock1 \\ shock2 \\ shock3 \\ shock4 \\ shock5 \end{bmatrix} \tag{2}$$

shock1= E_{gdp} , Shock2=E_{exr}, Shock3=E_{mpr}, Shock4= $E_{inflegt}$, and Shock5= E_{inf}

$$A=\begin{bmatrix} a_{11} & 0 & 0 & 0 & 0 \\ a_{21} & a_{22} & 0 & 0 & 0 \\ a_{31} & a_{32} & a_{33} & 0 & 0 \\ a_{41} & a_{42} & a_{43} & a_{44} & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} \end{bmatrix}\begin{bmatrix} dgdp \\ dexr \\ dmpr \\ dinfli \\ dinf \end{bmatrix}\begin{bmatrix} shock1 \\ shock2 \\ shock3 \\ shock4 \\ shock5 \end{bmatrix} \quad (3)$$

shock1= E_{gdp} , Shock2=E_{exr}, Shock3=E_{mpr}, Shock4= E_{infli}, and Shock5= E_{inf}

Equation (2) can be said to be the forward-looking expectation of inflation, while equation (3) is the backward-looking expectation of inflation.

4. Results and Discussion

4.1 Descriptive statistics

The descriptive statistics in table 1 provide a snapshot of six key macroeconomic variables over 57 observations. Inflation expectations from Google Trends (*infegt*) averaged 85.45, ranging from 51 to 137, indicating moderate variability. Inflation expectations from lagged inflation (*infli*) and actual inflation (*inf*) had similar averages of 14.13 and 14.10 percent, with values mostly ranging between 10 and 16 percent, though peaks of over 30 percent were observed. The exchange rate (*exr*) showed high volatility, averaging ₦312.53, with a wide range from ₦150 to ₦1,330.76, reflecting significant naira depreciation. Monetary policy rate (*mpr*) remained relatively stable, averaging 12.67 percent, with values between 6 and 22.75 percent. GDP averaged around ₦30 trillion, with notable growth variability ranging from ₦12 trillion to ₦65 trillion. The data reflects relatively stable inflation expectations and policy rates, alongside significant fluctuations in exchange rates and economic output.

4.1.1 Pre-estimation test

The unit root test results using the Augmented Dickey-Fuller (ADF) method show that all the variables in the model are non-stationary at level, given their high p-values (all above 0.90), exhibiting trends or persistent fluctuations over time, and lasting effects of shocks. The test at first difference showed stationarity of the variables. This indicates that these variables are integrated of order one I(1), that is, stable around a constant mean and variance only after differencing. Since all variables are stationary at first difference, this necessitates the use of the Vector Autoregressive (VAR) model for the analysis.

	Exr	gdp	inf	infegt	infli	Mpr
count	57.00	57.00	57.00	57.00	57.00	57.00
Mean	312.53	3.04	14.10	85.45	14.13	12.67
Median	305.65	2.98	12.77	78.00	12.72	12.00
Max	1330.76	8.60	33.20	137.00	30.88	22.75
Min	150.00	-6.10	7.78	51.00	7.64	6.00
std.dev	210.14	2.90	5.37	23.34	5.42	3.08
Skewness	2.68	-0.58	1.38	0.64	1.17	0.30
Kurtosis	12.07	3.75	5.15	2.30	4.27	4.82

Table 1: Descriptive statistics
Source: Authors computation

	Level			First difference		
Variable	ADF Statistic	P-value	Stationary	ADF	p-value	Stat
Infegt	-2.91	0.97	No	-2.91	0	Yes
infli	-2.91	0.99	No	-2.91	0	Yes
Exr	-2.91	1.00	No	-2.91	0	Yes
inf	-2.91	0.99	No	-2.91	0	Yes
Mpr	-2.91	0.97	No	-2.91	0	Yes
gdp	-2.91	0.11	No	-2.91	0	Yes

Table 2: Unit root test
Source: Authors' computation

4.2 Impulse response from Vector Autoregressive Estimates

The results indicate that shocks from surveyed measure of inflation expectations, considered forward-looking, have a very limited and short-lived impact on actual inflation, with the effect disappearing almost immediately. Similarly, shocks from lagged inflation display only mild persistence, fading out quickly and falling within confidence bounds. Exchange rate shocks show a small positive influence on inflation, in line with mild pass-through effects from currency depreciation. Inflation's own shocks also dissipate rapidly, indicating low persistence in the sample. Monetary policy rate shocks exhibit a small, delayed positive effect, possibly reflecting cost-push pressures or policy adjustments in response to inflationary trends. GDP shocks initially reduce inflation slightly, perhaps due to moderation in demand, before turning marginally positive, but overall, the effects remain minimal.

To estimate the structural var from equations 2 and 3 above, we first establish the cointegration relationship in the model.

Johansen cointegration for inflation expectation as a google trend

The result in the table below shows a long run relationship among the variables from the trace statistics and probability values. This means equation (2) can be run with a short run restriction since there is a long run relationship.

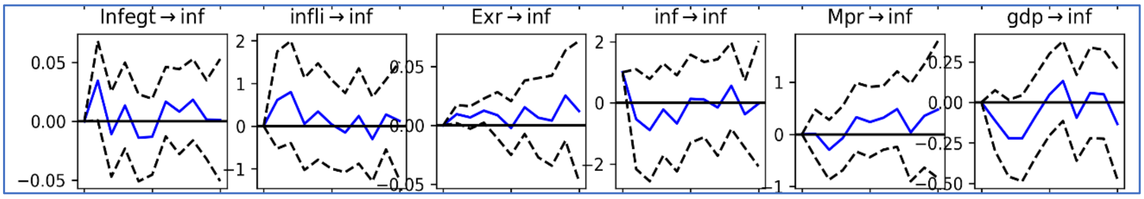


Figure 2: VAR Estimate result

No	Evalue	TracStat	Cri Value	Prob.**
None *	0.73	154.03	69.82	0.00
At most 1 *	0.52	83.53	47.86	0.00
At most 2 *	0.39	43.56	29.80	0.00
At most 3 *	0.19	16.52	15.49	0.04
At most 4 *	0.10	5.43	3.84	0.02

Table 3: Infegt Johansen cointegration
Source: Authors computation

Johansen cointegration for inflation expectation as a lag of inflation

The result in the table below shows no long run relationship among the variables given the trace statistics and probability values Therefore, equation (3) would be estimated with a long run restriction.

No	Evalue	TracStat	Cri Value	Prob.**
None *	0.40	53.16	47.86	0.01
At most 1	0.27	26.41	29.80	0.12
At most 2	0.13	10.22	15.49	0.26
At most 3	0.05	2.78	3.84	0.10

Table 4: Infli Johansen cointegration
Source: authors computation

Correlograms

Correlogram of Inflation expectation as a google trend, shows that the model is free from autocorrelation based on the lags chosen for the analysis. The correlogram below shows that most of the bars are below and within the 95% confidence bounds, indicating no serial dependence, which means analyzing the structural var in their differenced form would be efficient.

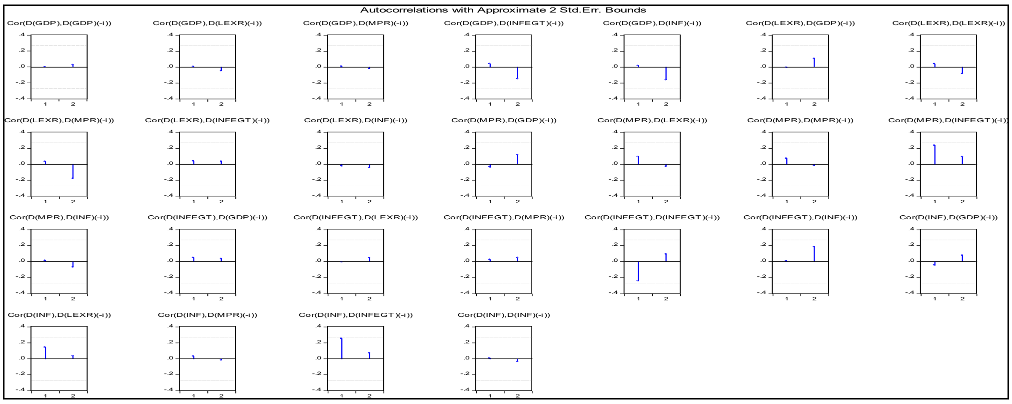


Figure 3: Correlogram of inflation expectation as a google trend

Similarly, correlogram of lag of inflation showed that the model is free from autocorrelation based on the lags chosen. This means analyzing the model of the structural var, with the differenced variable is efficient.

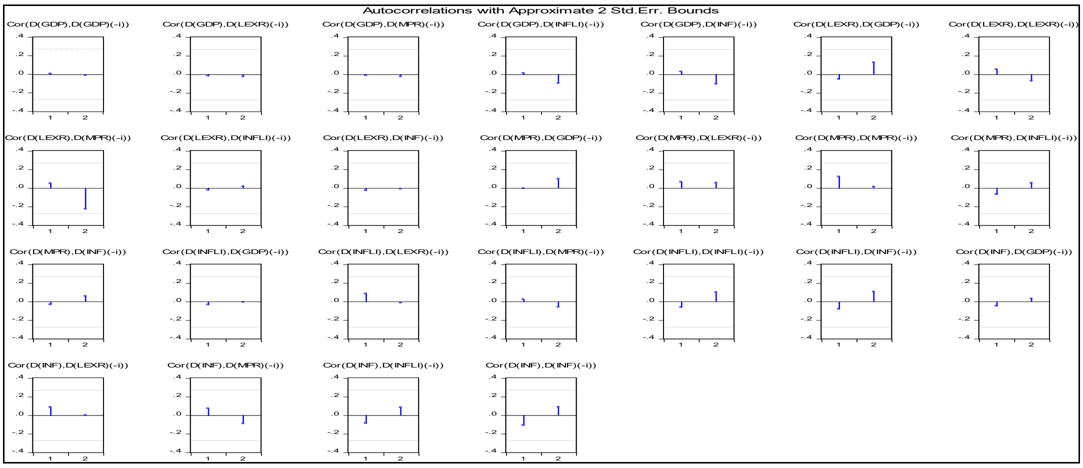


Figure 4: Correlogram of lag of inflation

SVAR impulse response analysis

The impulse response function (IRF) provides an understanding of the dynamic responses of the endogenous variables to shocks. In other words, IRF describes the reaction of the system as a function of time (or possibly a function of other independent variables that parameterizes the dynamic behavior of the system. The result below shows the shocks from inflation expectation from the google trend (fig.5) and lag of inflation(fig.6).

From the impulse response analysis, the structural shocks in the economy follow a clear transmission sequence: GDP → Exchange Rate → Monetary Policy Rate → Inflation Expectations → Inflation. Specifically, a positive GDP shock increases the output level, causing the economy to overheat. This expansionary pressure leads to a subsequent shock to the exchange rate, resulting in a decline in the exchange rate. The depreciation then triggers a shock from the exchange rate to the monetary policy rate, prompting an increase in the policy rate as the monetary authority responds to potential inflationary pressures. Following this, the shock from the monetary policy rate to inflation expectations resulted in a reduction in inflation expectations, reflecting improved market confidence in price stability. Finally, the shock from inflation expectations to actual inflation leads to a decline in inflation, completing the adjustment process and highlighting the role of credible policy actions in anchoring both expectations and prices. This chain of responses underscores the interconnected nature of macroeconomic variables and the importance of timely policy intervention to stabilise the economy.

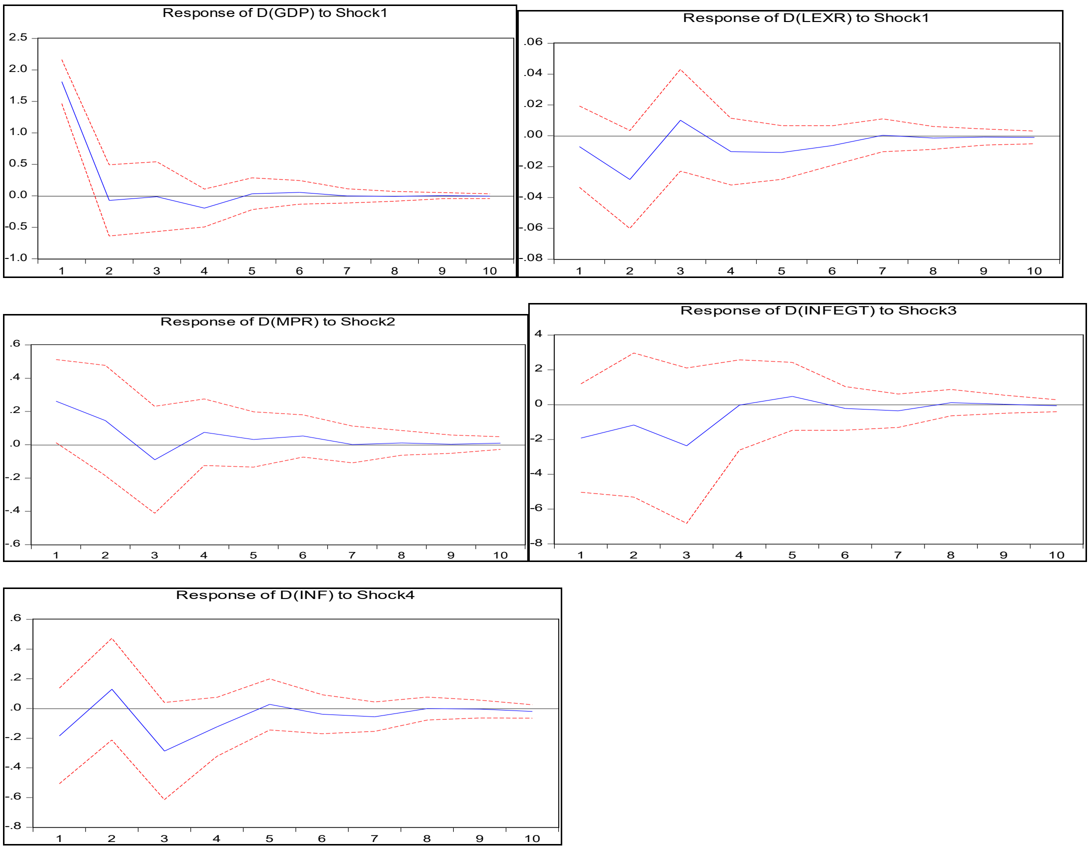
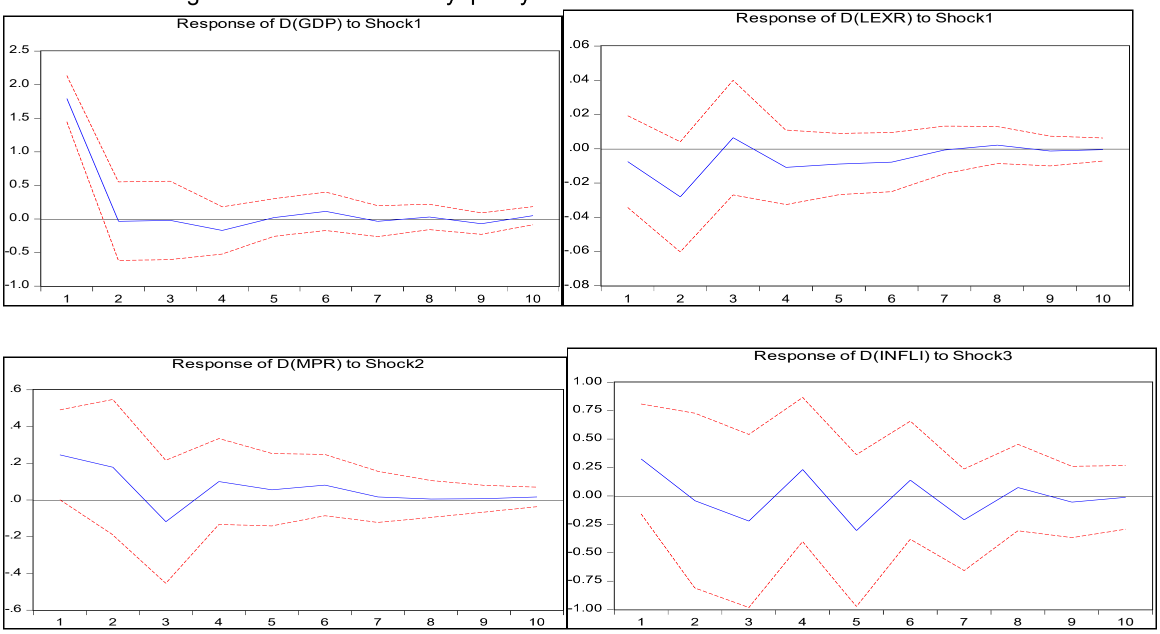


Figure 5: Impulse response and a pass through of *inflegt*

Figure 6 illustrates the transmission of shocks in a sequential order, moving from GDP to the exchange rate, to the monetary policy rate, then to inflation expectations (as a lagged variable), and finally to actual inflation. A positive shock to GDP increases output, while the subsequent shock from GDP to the exchange rate leads to a decline in the exchange rate. The shock from the exchange rate to the monetary policy rate results in an increase in the policy rate. Furthermore, the shock from the monetary policy rate to lagged inflation raises inflation expectations, reflecting a backward-looking adjustment before returning to a neutral state. Finally, a shock from inflation expectations, being backward-looking, leads to an increase in actual inflation.



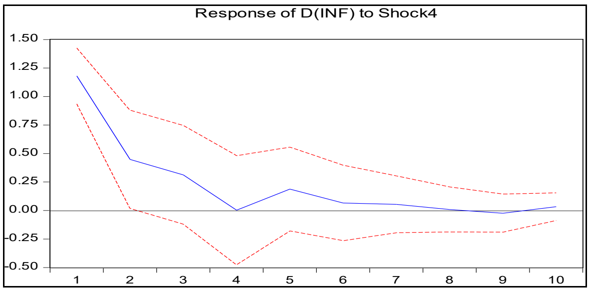


Figure 6: Impulse response and a pass through of *infli*

Forecast Error Variance Decomposition

The Forecast Error Variance Decomposition (FEVD) enables the investigation of the interactions among economic variables over the impulse response horizon. The results below showed the variance decomposition of inflation through shocks in infegt and the variance decomposition of inflation through shocks in infli.

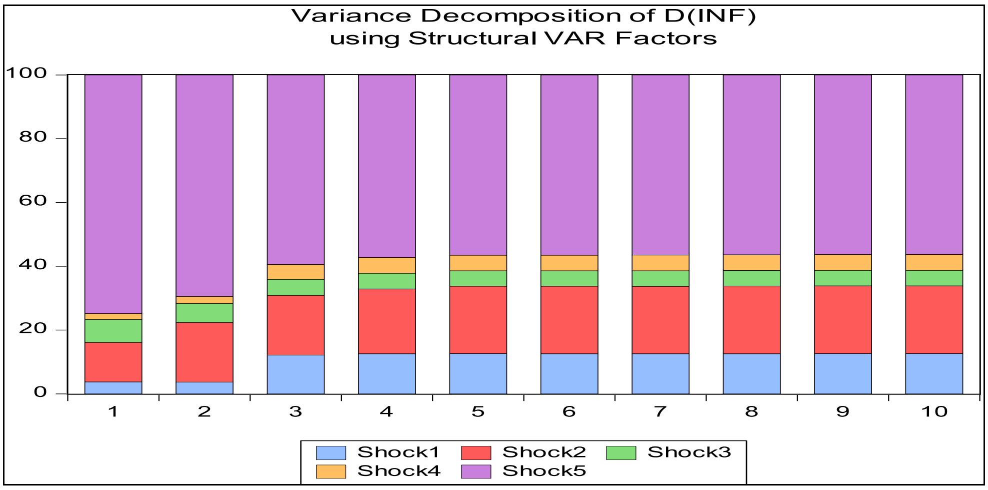


Figure 7: Variance decomposition of inflation (Eqtn 2).

The variance decomposition in figure 7 shows that inflation in this economy is solely driven by its own shocks, indicating strong persistence, thus suggesting that inflationary pressures tend to resurface themselves over time. Interestingly, inflation expectations, as proxied by Google Trends, play a minor role, suggesting that this proxy may not effectively capture forward-looking market or professional sentiment. Exchange rate shocks showed to be the next most influential, which reflects a significant pass-through from currency fluctuations to domestic prices, likely due to import costs and expectations. Shocks from real GDP growth have a moderate effect, showing that demand-side factors also matter, while the monetary policy rate shocks has a weak impact, implying limited transmission of policy through interest rates, which might possibly be due to the underdeveloped credit market and some level of fiscal dominance. It is crucial to understand that maintaining exchange rate stability and enhancing monetary – fiscal policy coordination to moderate fiscal dominance may be more important in managing inflation than depending solely on interest rate adjustments.

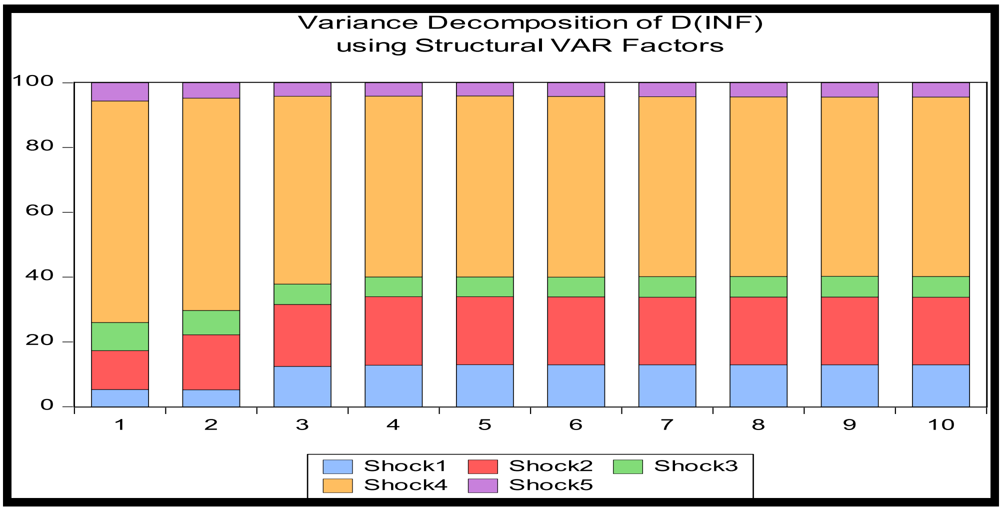


Figure 8: Variance decomposition of inflation (Eqtn 3)

Figure 8 shows the variance decomposition of inflation, and the result shows a highly persistent inflation process, with lagged inflation shocks explaining about 60–65% of the variance in inflation across all time horizons in the panel. This suggests that past inflation, rather than other shocks in the model, drives current inflation, this points to strong backward-looking expectations. Exchange rate shocks remain the second most important, confirming the continued importance of currency volatility due to import dependency and pass-through effects. Meanwhile, GDP growth contributes slightly, and monetary policy shocks showed a limited impact, which again reflects weak policy transmission or low credibility. The small role of current inflation shocks in this model compared to the earlier model where current inflation dominated, reveals a more entrenched, predictable inflation dynamic.

5. Conclusion and Suggestions

This study tries to investigate the role of inflation expectations in estimating inflation dynamics in Nigeria using Vector Autoregressive (VAR) and Structural Vector Autoregression (SVAR) models, it also incorporated two different proxies for expectations which are Google Trends data and lagged inflation, to capture the forward-looking and backward-looking inflation. The analysis offers important insights into how inflation dynamics in Nigeria.

The results further show that forward-looking expectations, as captured by Google Trends of inflation expectation data, have minimal influence on actual inflation. The SVAR showed that inflation expectation as forward-looking decreases inflation. The result of the lagged inflation, on the other hand reveals a strong degree of inflation persistence. Past inflation showed to accounts for about 60 to 65 percent of the variance in current inflation, suggesting that economic agents in Nigeria tend to rely strongly on historical price trends when forming expectations. This backward-looking behavior points to adaptive expectations and may reflect widespread indexation practices or slow adjustment of expectations. Also, the impulse response function from the SVAR showed that inflation expectation as backward looking increases inflation in the short run.

In both model specifications, exchange rate shocks consistently emerge as the second most significant driver of inflation in Nigeria, contributing about 15 and 25 percent of the variance in each model. This underscores the importance of exchange rate stability in Nigeria’s inflation management, especially given the country’s highly dependency on imported goods. The study further highlights the weak transmission of monetary policy through interest rates. The shocks from monetary policy explain only about 5 to 8 percent of inflation variance, suggesting that Nigeria’s monetary tools has low direct influence on inflation. This arises from the fact that the financial sector is not fully developed and remains bank-dominated with a relatively low credit market. The study has thus established that backward-looking expectations, where historical inflation patterns and exchange rate movements, play a far greater role than forward-looking expectations and monetary policy process in inflation dynamics in Nigeria.

The following are a few suggestions to enhance the effectiveness of monetary policy and improve inflation management.

Exchange Rate Stabilization as a Priority: The research shows that exchange rate shocks constitute the second most significant driver of inflation in Nigeria, which contributes 15-25% of inflation variance. With Nigeria's heavy dependence on imported goods, exchange rate volatility has direct impact into domestic price pressures. The Central Bank of Nigeria should continue to prioritize exchange rate stability through enhanced transparency and market discipline in foreign exchange management and building adequate reserves.

Strengthening Monetary Policy Transmission Mechanisms: The result of the monetary policy rate adjustments explains only 5-8% of inflation variance, indicating weak policy transmission channels. This indicates that traditional interest rate policy tools have little effectiveness in the Nigerian context. Policymakers should pay more attention to developing deeper financial markets, developing the banking system's efficiency, and improving coordination of monetary - fiscal policy actions.

Addressing Backward-Looking Inflation Expectations: The study shows that economic agents rely strongly on historical inflation patterns, with past inflation explaining 60-65% of current inflation variance. This backward-looking behavior develops inflation persistence and makes it difficult to anchor expectations around a targeted level. The Bank should step up on its monetary policy communication to move expectations from adaptive to forward-looking. This may require regular publication of inflation forecasts, and clear forward guidance on policy and the rationale. This is because the impulse response of the pass through of inflation expectation as forward looking reduces inflation while the pass through of inflation expectation as backward-looking increases inflation.

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Appendix

The lag length criteria showed the different lags to be taken in the model.

1. Lag length criteria of infegt

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-421.03	NA	8.99	16.38	16.57	16.45
1	-401.53	34.50	11.17	16.60	17.72	17.03
2	-379.95	34.02	13.09*	16.73*	18.79*	17.52*
3	-349.15	42.64*	11.24	16.51	19.51	17.66
4	-327.49	25.83	14.71	16.63	20.57	18.14

Based on the result of the above analysis, we choose the lag length criteria of 2, which was used in the estimation.

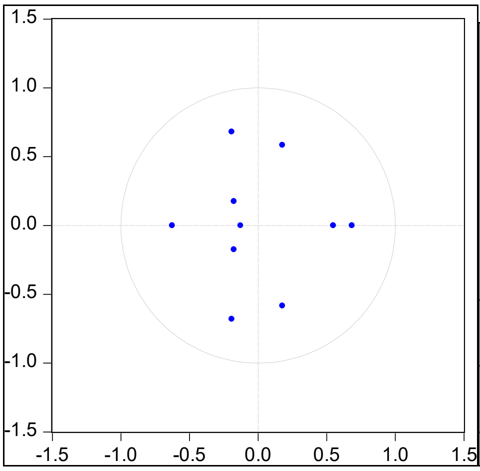
2: Lag length criteria of infli

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-262.93	NA	0.03	10.51	10.69	10.57
1	-229.13	59.66	0.02	10.16	11.30	10.60
2	-200.69	44.60	0.02	10.03	12.11*	10.82*
3	-162.14	52.91*	0.01*	9.50	12.53	10.65
4	-139.01	27.22	0.01	9.57	13.55	11.09
5	-105.71	32.64	0.01	9.24*	14.17	11.13

From the result in table 4, it was shown that the suitable lag length criteria was two, which was appropriate for the estimation.

3: AR roots/stability test.

Tests show that both models are stable and reliable for the estimation, this means the estimations can be relied on for policy analysis.



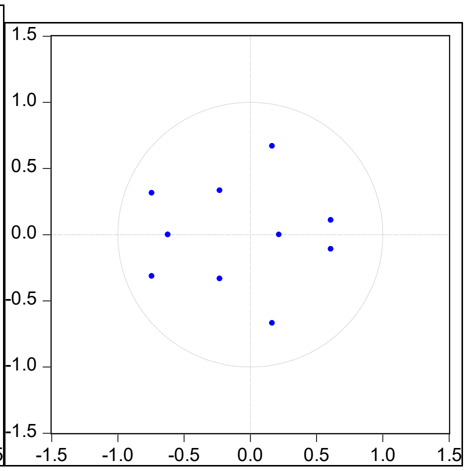


Figure 9: Inverse Roots of Ar Characteristics Polynomial of inflegt and infli model

5: Variance decomposition (in table) of infegt

Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5
1	1.81	3.74	12.38	7.19	1.85	74.84
2	1.88	3.67	18.73	5.93	2.23	69.45
3	1.91	12.13	18.74	5.01	4.64	59.48
4	1.92	12.55	20.33	4.90	4.94	57.28
5	1.92	12.60	21.14	4.84	4.87	56.54
6	1.92	12.59	21.16	4.82	4.88	56.56
7	1.92	12.55	21.14	4.86	4.96	56.49
8	1.93	12.57	21.22	4.89	4.94	56.38
9	1.93	12.59	21.25	4.89	4.94	56.32
10	1.93	12.59	21.25	4.89	4.95	56.31

5: 5ariance decomposition (in table) of infli

Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5
1	1.79	5.29	12.03	8.68	68.37	5.63
2	1.96	5.22	16.94	7.52	65.59	4.74
3	1.99	12.41	19.13	6.28	58.01	4.16
4	2.03	12.83	21.10	6.11	55.82	4.15
5	2.05	12.97	20.99	6.07	55.89	4.08
6	2.06	12.91	20.98	6.10	55.77	4.23
7	2.07	12.89	20.90	6.36	55.53	4.33
8	2.07	12.91	20.95	6.34	55.41	4.39
9	2.08	12.89	20.94	6.40	55.36	4.41
10	2.08	12.89	20.93	6.40	55.37	4.42