

Transmission of Periodic Shocks from Exchange Rate to Inflation in Nigeria: Local Projection Impulse Response Function (LPIRF) Approach

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Abstract The periodic shocks from exchange rate to inflation over the years have been a matter of great concern to policy makers in many import-dependent economies such as Nigeria. Hence, this study investigated the transmission of periodic shocks in exchange rate to inflation in Nigeria over the period 1981-2023. The study employed the innovative local projection impulse response function (LPIRF) to examine the response of inflation to shocks in exchange rate. Given several economic crises, policy and institutional changes in Nigeria, the model variables were subjected to multiple structural breaks. The LPIRF analysis reveals that the exchange rate pass-through (ERPT) to inflation in Nigeria is relatively low at 5.5% after two years, suggesting limited direct transmission of currency depreciation to consumer prices. This modest ERPT, although surprising, supports the hypothesis that foreign exporters to Nigeria engage in pricing-to-market strategies, absorbing exchange rate changes rather than fully adjusting export prices. It further indicates that while inflationary shocks from its own past values are short-lived, shocks from exchange rate variations have persistent effects, lasting up to a decade. Lastly, the counterfactual analysis confirms that exchange rate shocks, when conditioned on variations in the exchange rate, maintain a substantial pass-through to inflation. The study recommends that government authorities should consider improving foreign reserves management, implementing transparent foreign exchange allocation, and reducing parallel market pressures, as well as put in place structural reforms to promote local manufacturing and agricultural value chains that can mitigate the vulnerability of domestic prices to exchange rate fluctuations.

Keywords: inflation, exchange rate, shocks, local projection, impulse response, Nigeria

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1. Introduction

Exchange rate movements can have influence on consumer prices in an open economy such as Nigeria. This is particularly critical in the current situation where the country depends mainly on imported goods in both intermediate and consumption goods. Given the recent policy of the government to float the exchange rate and abolish multiple rates, the exchange rate has consistently depreciated averaging 45 percent. Between July and December, 2023, exchange rate averaged N1040 (CBN, 2024). During this period, the average inflation jumped from an average of 22% in 2022 to a 27% in December, 2023 and thereafter rose to 32% in March, 2024. The April's inflation rate was 33.7%, higher than March's 33.2%. The data for April showed the greatest rate of inflation since March 1996. According to the release's details, food, housing, and utility prices all grew more

quickly in April. Prices for apparel, footwear, and transportation, on the other hand, increased more slowly [1]. This current situation in Nigeria has generated controversy among economists and policy makers in the country and has accentuated the need for further study on periodic shocks in exchange rate pass-through to inflation

Theoretically, exchange rate shocks can be transmitted to inflation through direct and indirect links. According to [2], the direct effects work through two channels. First, through increased prices of imported goods as a result of exchange rate depreciations and second, through increased prices of imported manufacturing inputs due mainly to exchange rate depreciation which leads to high cost of production, and hence, increase in domestic commodity prices. However, the degree and timing of the overall effect of exchange rate shocks to inflation is uncertain, and may be influenced by many factors such as the rate of pass-through to import prices, demand conditions, the share of imports in basket of consumption and the expected duration of the shocks. On the indirect link,

exchange rate can affect consumer prices through aggregate demand and wage rates. Due to the depreciation of a country's currency, demand for export increases because increase in prices of imported goods lead to an increase in demand for locally produced substitutes, while cheaper prices of exported goods, in turn, raise foreign demand for such goods. The increase in demand for export eventually leads to higher demand for labour which raises wages and leads to higher prices [3,4].

Understanding the transmission of periodic shocks from exchange rate movements to inflation remains a critical empirical and policy concern for Nigeria, where exchange rate volatility has historically interacted with price stability in complex ways. In a macroeconomic environment characterised by high import dependence, recurrent currency depreciation, and exposure to global shocks, identifying the dynamic and potentially asymmetric responses of inflation to exchange rate variations is vital for monetary policy formulation and exchange rate management. While previous empirical studies have examined exchange rate–inflation linkages in various contexts, their methodological approaches—often relying on traditional vector autoregressions (VAR) and structural VAR (SVAR) frameworks—are constrained by restrictive structural assumptions, potential misspecification biases, and identification challenges.

This study advances the literature by applying the Local Projection Impulse Response Function (LPIRF) framework [5,6] to model the inflationary effects of exchange rate shocks in Nigeria. LPIRF offers several advantages over conventional time-series estimators. It bypasses the need for rigid structural identification, is robust to model misspecification, and can be estimated through simple regressions. Crucially, it allows for the detection of asymmetric and state-dependent responses, thereby capturing unique behavioural shifts in inflation dynamics under varying macroeconomic regimes [7,8,9]. This flexibility is particularly valuable in the Nigerian context, where structural breaks, regime shifts, and seasonal patterns are common features of macroeconomic data. Furthermore, the study enhances methodological rigour by integrating recent advances in unit root testing and structural break detection [10], thus addressing limitations of earlier African-focused research [11,12,13,14]. By accommodating multiple breaks and seasonality, and by estimating state-dependent coefficients, the analysis is positioned to yield more reliable and policy-relevant estimates. The adoption of LPIRF in this empirical domain—still rare within African macroeconomic research [14,15] [16,17]—therefore represents a methodological innovation and a significant value addition, providing deeper insight into the transmission mechanism of exchange rate shocks to inflation in Nigeria.

Following the introductory section of this work is section two which reviews related literature. Section three discusses data and methodological framework while section four discusses the empirical results and findings. Section five concludes with policy implications.

2. Literature Review

2.1. What does Theory Tell Us?

Theoretical evidence on exchange rate pass-through (ERPT) derives from the doctrines of the law of one price, the purchasing power parity and the monetary theory to exchange rate determination. The theoretical link upon which the nexus between prices and exchange rates is underpinned revolves around the doctrine of purchasing power parity which is an aspect of the law of one price. The core assumption here is that there are no trade restrictions and transportation costs. This nexus, connecting domestic price to exchange rate, derives from the law of one price, which posits that in the absence of trade barriers in a market under competition, homogenous products traded in various places must be sold at the same price once prices are expressed in same currency. Under equilibrium condition, prices of tradable goods in any two markets will be same once expressed in same currency, hence, facilitating a pass-through. It is worthy to note that purchasing power parity is the macroeconomic aspect of the microeconomic law of one price. The later connects exchange rates to the relative prices of a good, while the former connects exchange rates to the relative prices of a basket of goods. Also, the monetary theory combines [18]'s model of monetary exchange rate using the law of one price and purchasing power parity to clarify how variations in exchange rates would directly affect price levels. In fact, [19] had posited that the monetary approach to prices and exchange rates implies that all things equal, the rate of money supply growth increase proportionately to increase in the rate of inflation and the degree of exchange rate depreciation.

2.2. Empirical Literature

The transmission of exchange rate fluctuations to consumer prices—often referred to as ERPT—has long been a central topic in international macroeconomics. Classical models posit that a depreciation of the domestic currency increases the local currency price of imported goods and intermediate inputs, which in turn transmits to consumer prices either directly, through the tradable goods component of the CPI, or indirectly, through production costs and wage adjustments [20,21]. However, the extent and timing of this transmission depend crucially on the persistence and periodicity of the underlying shocks. Transitory, high-frequency fluctuations may be absorbed by firms' pricing-to-market strategies and inventory management, while persistent, low-frequency exchange rate changes tend to feed more fully into the CPI [22,23].

Recent empirical research has increasingly recognized the importance of periodicity in the ERPT process. Frequency-domain approaches, such as spectral decomposition and wavelet coherence, allow researchers to isolate short- and long-cycle co-movements between exchange rates and prices [23,24]. These studies typically find that pass-through is stronger at lower frequencies,

reflecting the greater likelihood of persistent exchange rate changes influencing price-setting behavior. For example, [24] show that in Turkey, periods of high inflation coincide with elevated low-frequency pass-through, while high-frequency fluctuations exert more limited and short-lived effects.

State-dependent and time-varying models further highlight that the periodic transmission mechanism is not constant over time. Time-varying parameter VARs (TVP-VAR) and Markov-switching frameworks reveal that ERPT varies across inflation regimes, policy credibility levels, and macroeconomic conditions [25,26]. Nonlinear approaches, such as the nonlinear ARDL model, also document asymmetries whereby depreciations exert a larger and more persistent effect on CPI than appreciations, especially when shocks are large or occur during periods of economic slack [27,28]. Moreover, periodic ERPT interacts with other macroeconomic shocks, such as oil price fluctuations or global commodity cycles. Frequency-domain studies suggest that these co-movements can be dominant at particular periodicities, potentially confounding the measured direct impact of exchange rate changes on CPI unless adequately controlled for [29]. As such, a combined methodological approach—integrating time-frequency analysis with regime-switching or nonlinear models—has emerged as a promising empirical strategy for capturing the complex, state- and frequency-dependent nature of exchange rate shock transmission to consumer prices.

In the context of Nigeria, [15] examined the implications of exchange rate pass-through on various price categories, including producer, consumer, export, and import prices, as well as its relationship with the Taylor rule, spanning the years 2000 to 2023. The analysis utilises threshold autoregression alongside self-exciting smooth threshold regression techniques. The results indicate the presence of non-linear relationships in how exchange rate depreciation influences pricing dynamics in Nigeria. It further indicates a critical threshold of 5 percent depreciation. Two sub-sample analyses support the primary findings, indicating that a threshold of 5 percent serves as the ideal benchmark to maintain the integrity of both demand and supply. At this level or below, the impact of exchange rate depreciation on inflation is significantly diminished, despite the inevitable rise in prices. Nonetheless, surpassing this threshold, the ramifications of depreciation on inflation become significantly pronounced, diminishing consumer demand for both imported and domestic products, while concurrently constraining the supply from producers of both exported and domestic goods and services within the economic landscape. The study of [14] investigated the exchange rate pass-through to domestic price in Nigeria using structural vector autoregressive (SVAR) estimation procedure. The study's outcome indicates that domestic price changes in the nation is cost-induced inflation, and as such monetary policy is ineffective to tackle it. The study further reveals that inflation is highly responsive to foreign and policy shocks. In a pertinent investigation, [30] determined, through both linear and non-linear frameworks, that the exchange rate serves as a more effective predictor of inflation compared to the money supply. In a similar vein, [31] observed that currency

depreciation exerts a varied impact on inflation and imported inflation, while also attenuating the adjustment process. Furthermore, the research identified a partial and imperfect connection in the short term, which expanded in scope over the long term.

The work of [16] looked at how ERPT affected inflation in Nigeria. The study analysed data using the ARDL (autoregressive distributed lag) model. The ARDL bound test shows that the variables all have a long-term link. The results show that import prices have a negative and statistically significant effect on consumer prices, but exchange rates have a positive and statistically significant effect. This finding lends credence to the idea that the central bank should tread carefully when considering devaluing the currency as a tool to spur economic expansion; doing so would have the dual effect of making inflation worse at home and raising the ERPT. Considering that devaluing the currency is not going to boost the country's export prospects on the global market.

The outcomes from other past research works in Nigerian on the degree of transmission of shocks from exchange rate to inflation differ significantly depending on the data frequency used and methodology adopted. Some studies carried out in Nigeria reported mixed result. During the same period, [12,13] adopted similar methodologies, SVAR and VAR respectively. The outcome of their empirical findings was mixed as the former indicated that exchange rate pass through is more impactful to inflation than it is to money supply, while result of the latter showed exchange rate as being incomplete, low and fairly slow in passing through to inflation. Similarly, [11] examined the effect of exchange rate changes on consumer prices in Nigeria using quarterly data from 1986 to 2013. The study employed vector error correction model (VECM) to investigate the relationship between exchange rate and domestic consumer price inflation. The empirical outcome similar to that [13] showed a substantial but incomplete and slow pass-through of exchange rate to domestic prices.

[19] examines exchange rate pass-through effect into import and consumer prices in Nigeria between first quarter of 1995 and first quarter of 2015. Using the Johansen co-integration method, and VECM; the study found the exchange rate pass-through into Nigeria's CPI inflation as being incomplete. The study further found the long run pass-through elasticities to be 0.24 and 0.30 for the baseline and alternative models. The main findings are that the effect was lower in consumer prices than in import, suggesting that the effect of the pass-through moves downward along the pricing chain.

By expanding upon previous research, especially within the African context, this study adds to the existing literature on exchange rate-inflation connectivity: To start, it utilizes the novel LPIRF which estimates unique local-based impulse responses [5,6,17]. Notably, this study is noteworthy for being one of the perspectives that has adopted this estimation to empirically examined the response of inflation to exchange rate variation, especially in the African region [11,12,13,14,15,16]. The advantages of the estimation over others such as VAR, SVAR, etc, include robustness to misspecification problem, the assumption of the structure not needed, in contrast to VAR and SVAR, identification problems not required, the

possibility of estimation using simple regression, as well as estimating asymmetries [5,6,7,8,9,17,32]. Additionally, several studies have shown that structural breaks is common in lengthy series and that ignoring them can result in inaccurate results [10,17,33]. The study's selection of estimating methodologies is likewise unique, which brings us to our fourth point. In contrast to previous research, which mostly used traditional stationarity estimating methods, this study incorporates a number of innovative approaches to estimate the parameters, taking care of structural breaks and seasonality in unit root and account for state-dependent coefficients.

3. Data and Methodological Issues

The statistics for the work was sourced from [34] covering the quarterly series from 1981Q1 to 2023Q4. To examine the impact of periodic shocks to the exchange rate on inflation, the study used the Local Projection Impulse Response Function (LPIRF) developed by [5] and updated by [35]. Due to its many benefits over VAR and SVAR, LPIRF has seen extensively used since its introduction by [5] as a substitute for impulse response produced by VAR. Because of these and other benefits, LPIRF was chosen above other methodologies used in studies focusing on Nigeria. According to various sources [5,6,7,8,9,17], the benefits include being resistant to misspecification problems, not requiring the assumption of structure like VAR and SVAR, not having to deal with identification problems, and having the option to simply use regression for estimation.

Presented below is the generic shape of an impulse response function:

$$IRF(t, h, d_i) = E \left[y_{t+h} \mid \mu_{t+h} \begin{cases} d_i \text{ if } j=0 \\ 0 \text{ if } j \in [1, h] \end{cases}; I_t \right] - E \left[y_{t+h} \mid \mu_{t+h} = 0 \forall j \in [0, h]; I_t \right] \quad (1)$$

Therefore, IRFs predict how the system's variables will respond at time $t+h$, where h ranges from 0 to H , to a shock applied to the disturbance vector d_i . This data is the collection of dependent variable vectors up to lag order p that are available at time t .

The preceding, together with the research of IMF-WEO (2016) and Marao (2025), leads to the declaration of the LPIRF as

$$\begin{aligned} IRF_{t+h} - INF_{t-1} &= \alpha_i^h + \\ &\delta^h \Delta S_{t-1} + \sum_{i=1}^p \delta_{1,j}^h \Delta S_{j-j} + \sum_{j=0}^p \phi_{1,j}^h \Delta RER_{t-j} \\ &+ \sum_{j=1}^p \phi_{2,j}^h \Delta INF_{t-j} + \sum_{j=0}^{h-1} \delta_{2,j}^h \Delta S_{t-h-j} \\ &+ \sum_{j=0}^{h-1} \phi_{3,j}^h \Delta RER_{t+h-j} + \varepsilon_t^h \end{aligned} \quad (2)$$

In this context, INF represents the inflation rate, RER stands for the real exchange rate, h is the time horizon ($h = 0, 1, \dots, H$), ΔS_t is the variable for shocks caused by variables other than the exchange rate (monetary policy shock), and δh is the variable for the cumulative effects on the inflation rate. Here, h is the time horizon. The third and fourth terms take into consideration shocks to the inflation rate and other factors that happen before time t but may impact the country's inflation outcome. The coefficient of INF_{t-j} explains the effects on inflation at its own lag. Inflation shocks and other variables that happen between t and $t+h$ can impact inflation at $t+h$. To account for these effects, [35] proposed terms five and six.

The analysis began by applying the multiple breakpoint test developed by [10] to see if there were any structural breaks in the series. This was necessary because Nigeria has experienced both economic and structural changes, including a change in exchange rate regime. In order to establish if the model variables were stationary, the research used [36] unit root tests with structural breakdowns.

Prior to determining the ideal lag length based on information criteria, the study estimated a VAR model with the greatest lag length. This allowed for the estimation of the LPIRF model. Estimating the LPIRFs was the subsequent stage. Reason being that IRFs have a number of drawbacks, one of which is serial correlation, which can lead to a wider marginal error [32]. To sidestep this issue, we can use two sets of conditional bands, as described by [32], to assess the relevance of each coefficient in a certain trajectory and to represent uncertainty over the form of the LPIRFs. After that, we enforce limits on impulse reaction and check how significant they are. The terms "joint" and "cumulative" refer to two types of statistical tests that are part of this one. While the "cumulative" hypothesis states that the total impulse reaction following the protected interval is zero, the "joint" hypothesis states that all response coefficients are jointly zero. In order to determine how one variable would respond to a shock in another (with all other variables held constant) as a result of the conditioning process, the study concluded with a counterfactual evaluation.

4. Empirical Outcomes

4.1. Descriptive Statistics

Broadly speaking, descriptive statistics are used at the start of every scientific study to lay the groundwork for more complex computations. Consequently, summary statistics were utilised for the relevant series in this study. This test primarily identifies the distribution's characteristics and the behavioural trends of the series, along with other relevant factors. Specifically, the data from the descriptive statistics shows whether or not the series are distributed normally. Consequently, a summary of the test results is shown in Table 1.

Apparently, based on the Jarque-Bera statistics, Table 2 shows that all the series deviates from the normal distribution. This result supports the choice of LPIRF at it yield robust estimates in the face of anomalous distribution [37,38,39,40].

Table 1. Descriptive Statistics

	Mean	Min	Max	Sks	Kts	JB	Prob
INF	16.6	9.50	23.2	1.09	2.8	15.9**	0.00
RER	431.7	6.98	982.4	1.09	8.71	98.8**	0.00
MS	34.82	3.89	65.8	2.81	3.49	18.9**	0.00

Note: ***(**) represent statistically significant at 1%(%) significance levels, respectively

4.2. Multiple Breakpoint (MBP) Test

The potential presence of structural breaks in a series is relevant to investigate given the occurrence of major national events such as adjustments in institutional structures, and exchange rate regime shifts, currency devaluation and the world events, including the surge in oil prices of 2015/2016, and the most recent instance of the COVID-19 Pandemic. Empirically, long series are typically associated with structural changes [10,17,41,42,43,44]. If ignored, the stationarity test may be nullified or false conclusions may be drawn about the stationarity and long-term connection [10,45]. In order to investigate the break point in the model, the study used the innovative MBP [10,33]. To sum up, Table 2 displays the results of the MBP.

Table 2. MBP Test

Hypothesis	Test statistics	1% critical value	5% critical value
1 Against 0	32.11**	6.17	4.51
2 Against 1	17.61**	6.03	5.16
3 Against 2	5.11	6.46	5.31
4 Against 3	5.50	7.18	5.71
5 Against 4	5.54	7.32	6.63
Min (max) breaks		2 (5)	2 (5)
Panel B: Break point Test			
1	65	2016_Q3	2016_Q2 2016_Q4
2	91	2020_Q2	2020_Q1 2020_Q3

Source: Author's computation **and * signifies rejection of null hypothesis at 1% and 5% level of significance level

Two structural breakdowns in the series are shown in Table 2 and are situated in third quarter of 2016 and second quarter of 2020 respectively. These two time periods correspond to some of the world's most notable events, including the shocks to the global oil price in 2015 and 2016, the COVID-19 pandemic that began in Wuhan, China in late 2019, and the global economic collapse that began in early 2020 [46,47]. A number of systemic breaks are present at the 5% significance level, as seen in Panel B. As a result, structural break is taken into consideration Zivot-Andrews unit root test (ZAURT) [37,48,49,50].

4.3. Unit Root Tests

Infinite deviations that do not regress to zero and lie on the unit circle are typical of time series data. Nevertheless, it has been noted that when these types of series are used for estimate, spurious regression occurs, which has little to no practical economic value [51,52]. The integration order of the variables was thus determined by looking at each one individually. According to [36], the alternative to the null hypothesis is that the investigated variable does not

have a unit root. Rejecting the null hypothesis is the standard procedure when the t-statistic value is greater than the critical value at a predetermined level of significance (in absolute terms). Table 3 displays the summary of the unit root test results:

Table 3. Summary of Zivot-Andrews Unit Root Test

Variables	Unit Root Statistics (Critical Value)	I (d)	Remark
RER	-5.43* (-4.93)	1	Stationary
MS	-6.09** (-5.34)	1	Stationary
INF	-5.10* (-4.93)	0	Stationary

Figures in parenthesis are critical values. ** (*) denote statistical significant at 1% and 5% levels of significance respectively. I(d) denotes the order of integration of a variable. Source: Authors' computation using E-views 9.0

Obviously, the result from Table 3 shows that exchange rate (RER) and money supply (MS) are integrated of order one (stationary at first difference), while inflation rate (INF) is stationary in level. Since the variables are integrated of different order, we cannot proceed test for co-integration, but estimate the LPIRF via VAR model.

4.4. Transmission of Periodic Shocks in Exchange Rate to Inflation Using LPIRFs

As previously mentioned, the initial step in estimating the local projection impulse response function (LPIRF) as outlined by Jorda [5,6], involves calculating and estimating a VAR (q) model, followed by the estimation of the LPIRF. The selection of lag length, determined by the information criteria with a maximum lag of six, was based on the Akaike Information Criterion. The outcome of the LPIRF is detailed in the appendix:

The solid green lines with circles represent the regular VAR impulse response function (VIRF), whereas the other solid lines denote the LPIRF, accompanied by the corresponding marginal error bands at a 95% confidence level. The LPIRF result shows a short persistence level of shock in inflation to its own shock as it takes only one year for shock in inflation to die up. It further shows that 5.5% of the shock from exchange rate was transmitted to inflation after 2 years (see Appendix A). Obviously, ERPT to inflation is 5.5 percent. This result suggests that there is low exchange rate pass-through into inflation and the result supports the findings of [13,14,30] but contradicts the result of [12] all for Nigeria. This is unexpected as the country is import dependent. However, this result suggests that most of the firms exporting to Nigeria practise high degree of pricing-to-market price setting system as they would prefer to allow the exchange rate variations to eat into their profit than to shift it to import prices.

4.4. Test of Significance Level of the Impulse Response Coefficients

Conducting the LPIRF with the conditional error bands allows us to test for the significance level of individual reactions and guarantees that the IRF coefficients are not serially correlated. According to [32], conditional error bands are useful for reducing serial correlation-induced

variability in IRFs. Both the Joint and Cumulative null hypotheses are supported by the conditional error bands. The cumulative null hypothesis states that the total impulse response after 10 periods is zero, while the joint null hypothesis states that all response coefficients are jointly zero. What follows is an overview of the findings from the LPIRF conditional band's individual significance level extraction (refer to Appendix B):

Table 4. Summary of Result of Significance Level of the LPIRF to a Shock in Inflation

Responses From	Joint Null Hypothesis	Cumulative Null Hypothesis
INF	0.00**	0.96
LRER	0.01*	0.03*
LMS	0.41	0.21

Source: Authors' computation using E-views 9.0 ** (*) denote statistical significant at 1% and 5% levels of significance respectively.

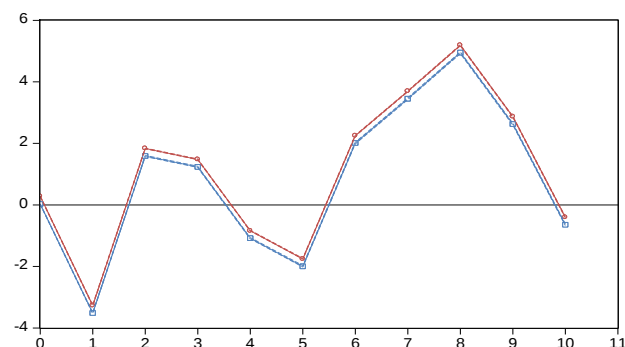
The p-values for the response function's significance level are displayed in Table 4. As a general guideline, if the p-value is 0.05 or smaller, we reject the null hypothesis. With p-values for the cumulative null hypothesis greater than 0.05, it is clear that shocks in inflation generated by their individual shock are highly significant at 1%, but do not have any significance when taken together. This suggests that inflation shocks that are itself compensated for do not last long and their effects fade quickly. Additionally, the outcomes substantially transmitted shocks from exchange rate variation into inflation. It further shows that both the joint and cumulative null hypotheses are rejected implying that response of inflation to shocks in exchange rate is significant even after ten years suggesting that it has a very long memory. This result is in line with the finding of [7,12,14,53]. [12] found out that exchange rate pass through into inflation in Nigeria is more significant than money supply. [30] determined, through both linear and non-linear frameworks, that the exchange rate serves as a more effective predictor of inflation compared than money supply. [7] employed LPIRF to study ERPT to inflation and found out 22% of ERPT into inflation and is significant after two (after 24 months). The study of [14] investigated the exchange rate pass-through to domestic price in Nigeria using structural vector autoregressive (SVAR) estimation procedure indicates that inflation is highly responsive to foreign exchange rate and policy shocks. However, the outcome in Table 4 shows that the response of inflation to shock in money supply is insignificant in line with the the studies of [14].

4.5. Counterfactual Responses Conditioning on Shocks in Another Variable

In order to examine the change in system's behavior, we follow [32], we construct a conditioning response path. By deducting 0.25 points from each coefficient, we limit the response of inflation to an exchange rate shock. The first impulse responses with conditional error bands are shown by the solid (blue) lines with squares and the corresponding dashed (blue) lines. The bottom graph shows the counterfactual reaction as a solid (red) line with

circles, whereas the top panel shows the conditional response given this counterfactual.

Figure 5.1: NIGERIA
Response of LMS to shock in LMS



Counterfactual: Response of INF to shock in LMS

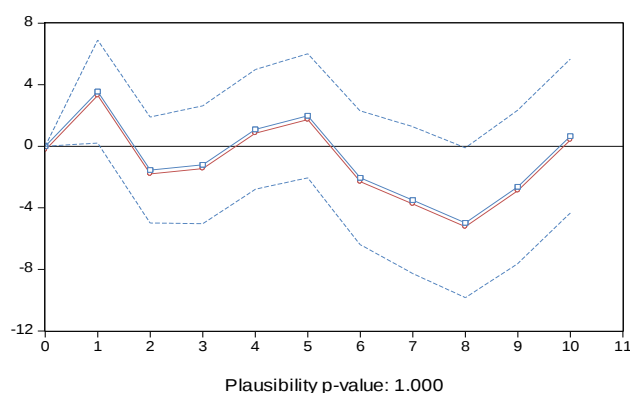
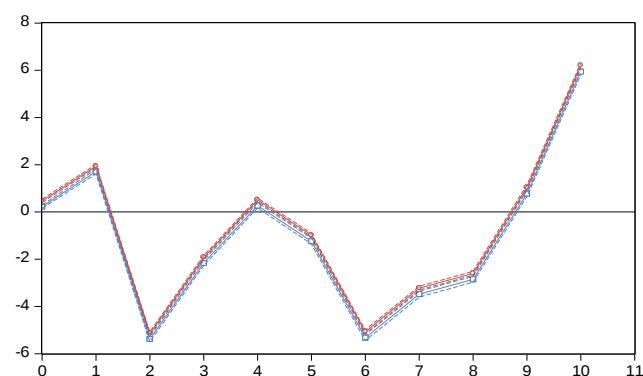
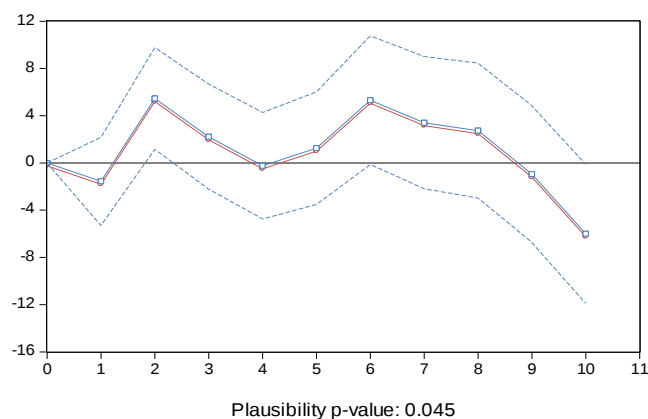


Figure 5.2: NIGERIA
Response of LRER to shock in LRER



Counterfactual: Response of INF to shock in LRER



The above Figure is the response of inflation to shock in money supply condition upon monetary policy shocks. The p-value measures the distance between the conditioning event and the sample estimates [32]. From the result we conclude that the response of monetary policy shock does not significantly transmit to shock in inflation in Nigeria since the p-value is greater than 0.05.

To ascertain how inflation reacts to a shock in exchange rate due to the exchange rate variation in Nigeria, we estimate the counterfactual of response of inflation to exchange rate shock conditioning upon exchange rate variations. The impulse response function is presented in figure 5.2 below. Obviously exchange rate shock due to conditioning path significantly pass into inflation in Nigeria as the p-value is 0.045 (less than 0.05)

5. Conclusion and Policy Implications

Given that the Nigeria's macroeconomic environment is characterised by high import dependence, recurrent currency depreciation, and exposure to global shocks, identifying the dynamic and potentially asymmetric responses of inflation to exchange rate variations is vital for monetary policy formulation and exchange rate management. Thus, the study investigates the transmission of periodic shocks from exchange rate movements to inflation using the novel local projection impulse response function (LPIRF). The LPIRF analysis reveals that the exchange rate pass-through (ERPT) to inflation in Nigeria is relatively low at 5.5% after two years, suggesting limited direct transmission of currency depreciation to consumer prices. This modest ERPT is surprising given Nigeria's high import dependence, but the result supports the hypothesis that foreign exporters to Nigeria engage in pricing-to-market strategies, absorbing exchange rate changes rather than fully adjusting export prices. The significance test indicates that while inflationary shocks from its own past values are short-lived, shocks from exchange rate variations have statistically significant and persistent effects, lasting up to a decade. In contrast, money supply shocks have no significant long-run impact on inflation, aligning with studies that highlight the dominance of exchange rate movements over monetary aggregates in driving Nigerian inflation dynamics. Counterfactual analysis confirms that exchange rate shocks, when conditioned on variations in the exchange rate, maintain a statistically significant pass-through to inflation (p-value = 0.045). This underlines the exchange rate's strategic importance in inflation management.

The study therefore makes the following recommendations:

First, the persistence of exchange rate-induced inflationary effects suggests that reducing volatility in the foreign exchange market should be a primary macroeconomic objective. Also, government authorities should therefore consider improving foreign reserves management, implementing transparent foreign exchange allocation, and reducing parallel market pressures. Second, government should put in place structural reforms to promote local manufacturing and agricultural value chains that can mitigate the vulnerability of domestic prices to exchange rate fluctuations. Targeted incentives for import

substitution industries could further reduce ERPT exposure. Third, since money supply shocks are not a significant driver of inflation in the long run, the Central Bank should align monetary tightening with exchange rate stabilization measures rather than relying solely on interest rate adjustments. Fourth, as a matter of urgency the Nigerian government should negotiate trade agreements and import pricing arrangements that reduce exchange rate sensitivity of import prices, leveraging pricing-to-market practices to its advantage. Lastly, the government should adopt a hybrid inflation-targeting regime that explicitly incorporates exchange rate movements into the policy reaction function, allowing proactive measures when exchange rate shocks emerge.

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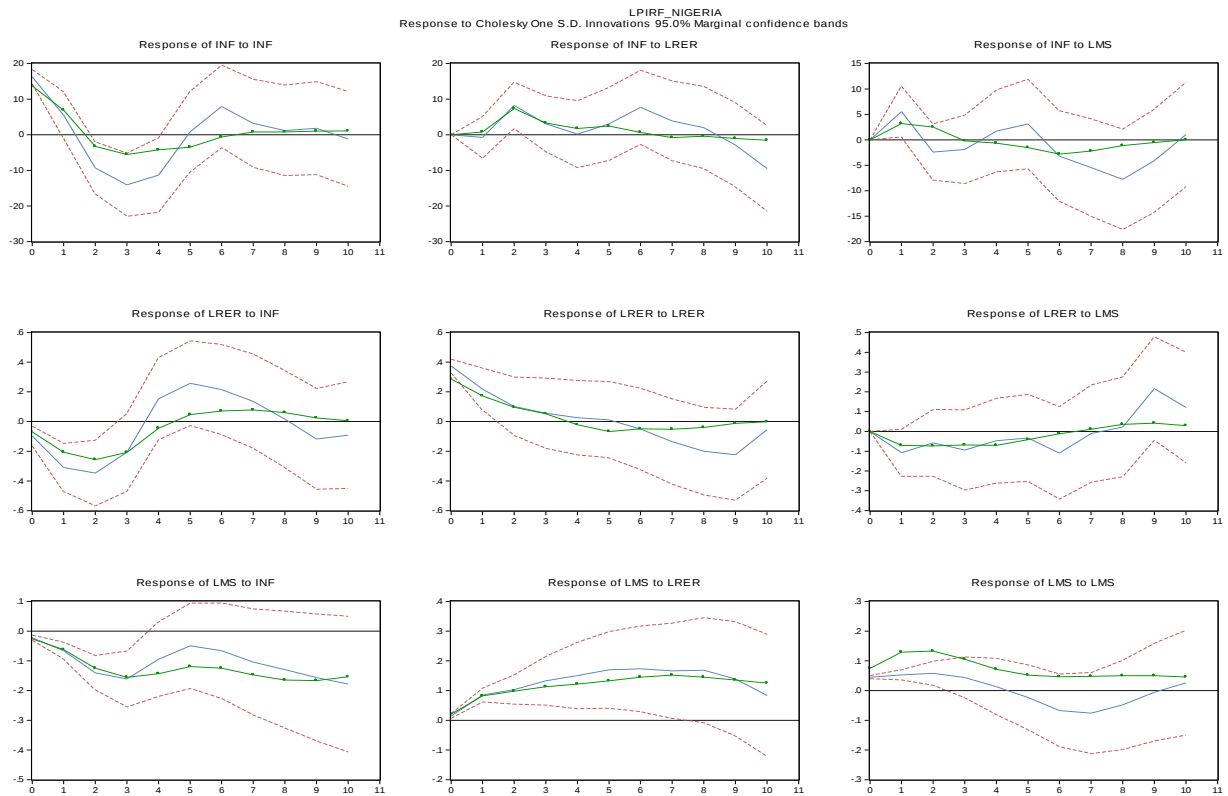
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Appendix A:

LPIRF



Appendix B:

