

Exchange Rate Pass-Through and Inflation Dynamics in Nigeria: An Analysis of Macroeconomic Impacts and Policy Implications (2006-2023)

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Abstract

This paper analyzed the foreign exchange pass-through to inflation in Nigeria for the period of 2006 to 2023. The exchange rate pass-through mechanisms into domestic prices were investigated by using the separately identification Structural Vector Auto Regressive (SVAR) model. The approach adopted in the analysis captures non-linearity and lags through ERPT, especially based on higher amplification ratios of consumer prices to exchange rate fluctuations after 2014. These studies showed proof that cost pull brought about by depreciations is highly costly to inflation and that monetary policy cannot fully address the problem of exchange rate impulses to inflation. The estimation via impulse response functions as well as the variance decomposition results signify not only the short-run and long-run effects of exchange rate fluctuations on inflation, but also increased responsiveness to foreign shocks and policy actions. More specifically the study raises awareness on the importance of exchange rate stability for managing inflation and calls for a synergy of fiscal, monetary and trade policies to address structures shocks. Plays recommended include appropriate controls of the nominal exchange rate, mechanisms of inflation targeting, the adoption of a flexible interest rate system and also better surveillance systems of the impacts of exchange rate shocks in order to reduce the impact of the shocks on consumer welfare, investment, and economic stability.

JEL Classification: E31, F31, E52, F41

Keywords: Exchange Rate Pass-Through (ERPT), Inflation Dynamics, Nigerian Economy, Monetary Policy, Price Stability

1.0. Introduction

Exchange Rate Pass-Through (ERPT) is defined as the proportion with which a country's exchange rate changes are reflected in domestic prices particularly the price of imported goods and services. This phenomenon is relevant for analyzing inflation behavior and the response of countries with high import dependence, including Nigeria. In Nigeria for instance, ERPT has both macroeconomic implications and policy hurdles. Fluctuations in the exchange rate exposed can therefore quickly translate into the domestic economy where there tend to be high levels of importation whether as final consumer goods or intermediate products. This often results in so called 'imported inflation, where a depreciation of the Nigerian Naira (NGN) has a direct bearing on prices of imported goods that lead to inflation pressures which undermines the consumers' purchasing power and can destabilize the economies (Bello & Sanusi, 2019).

The Nigerian economy has been identified to be most vulnerable to ERPT because the country relies on imports for essential goods and at the same time it relies on export of oil as the major source of foreign exchange earnings. Due to the large amount of importation, domestic prices are thus volatile with respect to changes in exchange rate. For example, fluctuations in exchange rates; when they decline, imports become costly, leading to price increases of commodities... This imported inflation remains a perennial factor, as it deepens inflationary pressures in Nigeria's economy, and put CBN in a difficult position in its inflation control mandate (Adekunle, Tiamiyu, & Odugbemi, 2019). The relationship between exchange rates, imports, and domestic price is one of the core policy choices when seeking to achieve balance between exchange rate and price stability.

Traditionally, Nigeria was endowed with huge oil deposit which served as the main stay of the economy. This has in particular made the nation's currency sensitive to the fluctuations in the international oil prices. Whenever there is fluctuation in the prices of oil in the global market, then the NGN fluctuates in the same direction with Nigeria's foreign exchange reserves. Crude oil is Nigeria's largest source of foreign exchange earnings and behaves as a determinant of NGN's exchange rate vis-a-vis any changes in the global crude oil price. The relationship between oil prices and currency volatility has an implication on the costs of imports because a weak NGN increases import costs, thus escalating inflation. Consequently, reliance on the oil sector does not only affect the exchange rate but also inflation rate and hence policy and stability in Nigeria.

In their words, higher inflation rate may lead to such problems as instability in the economy and the purchasing power parity. Other foreign markets pay for Nigeria's oil exports in dollars which the country largely depends on. They further found out that the stability of the economy and inflation rates are both influenced by the value of the currency as a result of change in oil prices across the world (Adekunle, Tiamiyu, and Odugbemi, 2019). Among the many essentials that Nigeria has no option than to import are food and gasoline. The cost of essential imports is also significantly sensitive to exchange rate fluctuations and is highly likely to be affected by volatility in exchange rates thus making it volatile (Helmy et al., 2018).

ERPT has also other consequences affecting the economy: Inflation is not only limited to the local level. Exchange rate fluctuations which cause a sustained high inflation impact on people's purchasing power and consequently poverty level and income inequality. Also, the investment environment is not spared from the turbulence caused by ERPT. When inflationary pressures are compounded by exchange rate risk it becomes unfavorable for foreign investors because they may regard such conditions as high risk. This situation may lead to reduced FDI inflow, stiffening the country's ability for economic diversification and sustainable development of the Nigerian economy. Thus, it is obligatory to understand ERPT not only for monetary stability; the Nigeria needs to stay competitive and capable to attract the investments necessary for its development and its economical security. As in Bello and Sanusi (2019), ERPT's challenges could be exacerbated by policy gaps or lack of policy harmony. Where such people alter their behavior and begin to stockpile goods for instance, in anticipation of higher costs due to changes in exchange rates, the pass-through effect may be aggravated if firms and consumers expect regular and significant changes in exchange rates.

It has been established from empirical research that the extent of the pass-through sways of the exchange rate on inflation may be low, moderate, or high, or even incomplete. For instance, Kehinde (2022), Jongrim, Stocker and Hakan (2020), Ari et al., (2021), Adekunle, Tiamiyu, and Odugbemi (2019) and thus, the result above contradicts the main hypothesis that suggested Exchange Rate Pass-Through (ERPT) is an important factor influencing inflation in Nigeria. Thus, the study seeks to establish pass-through effects on the consumer prices and exchange rate volatility. The investigation explores the nature of relations in the monetary sector of the Nigerian economy. The remainder of the study is divided into literature review, methodology, results and discussion, conclusion and recommendation.

2.0. Literature Review

2.1. Theoretical Literature Review

The Cost-Push Theory provides a basic perspective to comprehend inflationary forces in Nigeria more extensively as regards to ERPT. As noted, earlier cost inflation is occasioned by a rise in the cost of production due to reasons that include but not limited to increase wages, raw materials and energy prices thus forcing business to transfer these higher prices to consumers. Exchange rates are especially important for a country like Nigeria that depend heavily on imported intermediate goods and consumer goods; hence any variation in exchange rates leads to an increase in the price of imports which in turn cause an increase in the general price level through cost-push inflation. Looking at the case of Nigeria, cost-push inflation is well correlated with the country's import dependency hence any depreciation of the Naira translates to a higher cost of imported goods which are direct input in most production processes. The country's high import base coupled with constant depreciation of currency triggers high import cost hence placing strong inflationary pressure on businesses that pass the cost on consumers. Similarly, this inflationary effect can feed into the unemployment-model led wage-price inflation spiral whereby through rising costs berated consumers and firms call for higher wages for their employees. This will also apply to wages since wage increments can also lead to even more increase in labor cost, meaning that in an attempt to balance their own cost, businesses also put upward pressure on price leading to inflation.

A supply shock is another cause of cost- push inflation in Nigeria because it covers events that actually impact on the cost or availability of imported goods. A case in point is the fluctuations of the global prices of oil because they as well influence revenues collected as well as contributing to currency fluctuations. Many Nigerian enterprises rely on imported energy products; therefore, oscillating oil prices have an impact on production and, consequently, prices for end consumers. Furthermore, a number of prices influence the energy prices since energy is an input to many industries and hence inflation is sensitive to such price changes.

The second factor of cost-push inflation in Nigeria is imported inflation through which currency depreciation raises the cost of imports. Considering Nigeria's structure of operating under Import List system, devaluation of Naira affects the prices of goods and services within Nigeria particularly food, fuel and raw materials. In this case, the exchange rate fluctuations cause inflation since they increase the price of these imported goods, this brings us close to the Cost-Push Theory situation.

The central banks normally employ monetary policy to deal with inflation but dealing with cost-push inflation occasioned by exchange rate fluctuations is not easy. The kind of inflation that occurs like this originates from forces outside the demand side or the supply side, and therefore

conventional monetary instruments such as the interest rates may not be very useful. However, Nigeria's central bank may use some recommendation operating by fixing the Naira and advocating for the expansion of measures that can shield the economy from exchange rate fluctuations and decrease dependence on imported products. The analysis of Cost-Push Theory of inflation is therefore helpful in emphasizing the importance of collective approach to exchange rate policies and structural changes in the Nigerian economy for enhanced price stability.

The Law of One Price and Purchasing Power Parity

The relationship between prices and exchange rates can be explained on the basis of PPP that has emerged from the LOOP while assuming that barriers to trade and transport costs are nonexistent. However, in real life, trade barriers do exist, which distort the tenets of PPP to their very core. According to the law of one price (LOOP), if there are no trade barriers, and in a market with free competition and flexible prices, identical goods sold in different locations should be priced the same when expressed in the same currency. Therefore, a change in the domestic currency's value would lead to an equal change in the price in the foreign market, even if the two markets are in separate countries. Yet, due to trade barriers, the LOOP may not always hold true. This is because factors such as production costs, producer markups, and exchange rate fluctuations can influence both domestic and import prices (Feenstra and Taylor, 2008).

Monetary Approach to Exchange Rate Determination

The monetary theory integrates Krugman's (1986) monetary exchange rate model with the LOOP and PPP to explain how shifts in exchange rates directly impact price levels. According to the monetary approach to prices and exchange rates, assuming all else remains constant, an increase in the money supply growth rate should correspond to a similar rise in inflation and depreciation of the exchange rate. This model demonstrates that, in the long term, all nominal variables such as the money supply, interest rates, price levels, and exchange rates are interconnected. Consequently, monetary policy decisions can significantly influence key economic outcomes, particularly prices and inflation.

2.2. Empirical Literature Review

The empirical findings on exchange rate pass-through (ERPT) to inflation explores numerous global contexts and methodologies, contributing a deeper understanding of the factors that influence the transmission of exchange rate fluctuations to domestic prices. This empirical review synthesizes crucial studies to highlight their objectives, methods, findings, and policy recommendations.

Tosan, Ezi and Egbon from 1990 to 2022 employed Autoregressive Distributive Lag (ARDL) to analyze the impact of exchange rate pass-through (ERPT) to inflation rate in Nigeria. To measure inflation rate, the consumer price index was used as the dependent variable and nominal effective exchange rate, import price index, and global oil price as independent variables. The results further show that the coefficient estimate for exchange rate has a positive and significant impact on the inflation rate.

Using nonlinear autoregressive distributed lag (NARDL) method from January 2000 to May 2021, Kehinde (2022) examines the degree of exchange rate pass-through to inflation. The analysis of the empirical findings showed that inflation in Nigeria is not determined by only monetary factors

while industrial production contributes to the reduction of consumer prices. Money supply and exchange rate were established to be influential factors of inflation than the exchange rate.

Ari et al. (2021) Through structural vector autoregression (SVAR) they conducted an analysis of Mozambique economy for the period 2001 to 2019 with the specific objective of evaluating the ERPT. they noted that the extent of pass through was found to vary with exchange rate regime with more flexible regimes being more responsive to exchange rate shocks.

In another study Jongrim, Stocker, and Hakan (2020) consider the link between inflation and ERPT for 55 countries more generally. They employed a factor-augmented vector autoregressive (FAVAR) and identified that lower pass through is observed in countries with flexible exchange rate regimes and credible inflation targeting framework. Besides, they noted the importance of identifying the type of external shocks and the structure of the economy while dealing with price responses following the exchange rates.

Adekunle, Tiamiyu, and Odugbemi (2019) investigate the asymmetry in ERPT to consumer prices using co-integration techniques in Nigeria from 2001 to 2015. The empirical result revealed that partial pass-through in the short term and emphasized that the impact of exchange rate fluctuations on consumer prices is more noticeable when the effects are asymmetric.

Using structural VAR, Martina, Richhild, and Elod (2019) investigated an emerging and advanced economies, analyzing ERPT. The empirical findings show that ERPT in emerging economies declines following financial shocks, while it remains low and stable in advanced economies.

Kassi et al. (2019) investigated the relationship between exchange rate shocks and consumer prices in SSA with cross-panel framework threshold approach. This study showed that there is a symmetry in ERPT where the impact of exchange rate increase is different from that of a decrease. Mehmet, Ojonugwa, and Esther (2019) re-examined the ERPT for Nigeria and South Africa using structural vector autoregressive model. The findings of the empirical analysis showed that both countries' exchange rate regimes explained an ERPT level, with Nigeria obtaining a higher pass-through rate than South Africa.

From 1995 to 2018, Bada et al. (2016) investigated Nigeria's inflation behavior particularly with emphasis on the exchange rate-inflation nexus and other factors using the smooth transition regression (STR). The authors established that exchange rate devaluation or depreciation is the key determinant of the changes in inflation regimes. Their research reveals the importance of stable exchange rate regime in limiting inflation, especially in high inflation countries.

The study on the relationship between exchange rate and inflation which was conducted by Abiodun et al. (2016) used Johansen co-integration and vector error correction mechanisms to analyze economy of Nigeria from the period of 1995 to 2015. The results also revealed that the pass-through effect in Nigeria is weak and that import prices have a stronger pass through compared to domestic prices. They noted that there is a need to take into explanation the open economy character of most countries, especially the effects of changes in exchange rates, while making monetary policies to stabilize price levels.

Using a structural vector autoregression analysis, Helmy et al., (2016) investigated Egypt's ERPT from 2000 to 2014. The authors discovered that exchange rate fluctuations create short-run and long-run consequences for various categories of products, and these consequences differ by product type. Their study also emphasizes on the need to adopt good policies on exchange rate to enhance price stability.

Lariau, El-Said and Takebe (2016) used Structural VAR model to analysis the effect of exchange rate on consumer prices in Angola and Nigeria. The results showed that exchange rate movements affect inflation together with domestic demand pressure, supply shocks and monetary policy. According to their research, central banks need to effectively address changes in exchange rate in order to achieve price stability.

Aaberge et al. (2016) examined the link between exchange rates and international trade in developed and the underdeveloped economy. The panel analysis carried out by their study revealed that exchange rate movements affect trade competitiveness, which in turn affects export quantities. They call for the formulation of a set of polices in the area of exchange rate and trade.

Özyurt (2016) examined the trends of ERPT in the euro area with the help of ARDL models. The author discovered that fluctuations in ERPT are a result of various macroeconomic factors such as world trade, inflation differentials, and monetary policies relationship. His study supports proper management to ERPT in order to meet the inflation goals.

Tunç (2017) used the panel analysis to examine the nonlinearities and asymmetries in ERPT for 27 emerging markets over the period of 1990-2013. His research established that large depreciation events cause considerable nonlinear pass-through outcomes when depreciation is above 24%. He strongly focuses on the fact that inflation targeting frameworks play the key role in the formation of ERPT outcomes.

Nidhaleddine and Wael (2014) analyzed ERPT dynamics of developing countries using a panel threshold analysis. This led them to come up with the conclusion that higher inflation rates make the exchange rates and domestic prices more closely related. The study also forms a good background in the analysis of how inflation rate and ERPT affect the formulation of appropriate monetary policies in developing countries.

In specific, Hassan and Simone (2013) applied OLS to examine the exchange rate determination under the monetary policy rules in underdeveloped economies. Their results indicated that in such economies, exchange rates depend on trade balances, interest rate differentials, capital flows and external shocks.

Jiadan and David (2013) examining the ERPT to inflation using SVAR methodology in China. The study found that currency depreciation enhanced higher import costs, contributing to inflation, while currency appreciation can possibly lower inflation.

The empirical research has shown that the pass-through sways of the exchange rate on inflation may be low, moderate, or high, or even incomplete. For example Kehinde (2022), Jongrim, Stocker and Hakan (2020), Ari et al., (2021), Adekunle, Tiamiyu, and Odugbemi (2019) and Bada, Olufemi, Tata, Peters, Bawa, Onwubiko, and Onyowo, (2016) reported a lower or moderate pass-through while Abiodun, Ajibola, Inuwa, Idowu et al., (2016), Ehsan and Dalia (2001), Martina, Richhild and Elod (2019), Nidhaleddine and Wael (2014), Mehmet, Ojonugwa, and Esther (2019), Kassi, Rathnayake, et al., (2019), Aaberge, Lian, et al., (2016) reported either high pass-through or incomplete pass-through. Therefore, there is insufficient evidence to establish a clear link between Exchange Rate Pass-Through (ERPT) and inflation in Nigeria. The study will broaden the timeframe by incorporating the latest data to reassess the impact of exchange rate pass-through on inflation dynamics in Nigeria.

3.0. Methodology

3.1. Data and Source

The data used in this study are periodic, specifically time series data, consisting of monthly observations from 2006 to 2023. The starting point was chosen based on the availability of monthly data for the selected variables, and 2023 was included to fill gaps in the existing literature, providing more current and relevant economic data. Additionally, the use of monthly data offers the advantage of a larger sample size compared to annual time series data. The data are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2023) and the official CBN website. It is important to note that all variables in this study are consistently presented in their standardized forms, ensuring precision and consistency in data presentation.

3.2. Model Specification

This paper builds upon the work of Tosan, Ezi and Egbon (2024), who specified the following model: $CPI = f(MPR, EXR, IMPI, OILP)$ (1); Where: MPR is the monetary policy rate, EXR is the nominal exchange rate, IMPI is import price index, and OILP global oil price. To align with the objectives of this study, the model is modified and specified in the following functional form: $INF_t = f(INF_{t-1}, EXR_t, INT_t, OILP_t)$ (2)

The modification emphasizes the lagged effects of inflation and the dynamics of interest rates, shifting the focus away from solely monetary policy actions (MPR) and the import price index. This change aligns the model with the objectives of the study.

3.3. Estimation Technique

The paper employs the Structural Vector Autoregression (SVAR) model to analyze the relationship between exchange rates and inflation in Nigeria. The SVAR model expresses each variable in the system as a linear function of its own past values, the past values of other variables, and a set of structural shocks. In the general form of a SVAR model, we can write it as follows:

$$\begin{cases} y_t = C_y + \sum_{j=1}^p \beta_{yj} y_{t-j} + \sum_{j=1}^p \beta_{2yj} X_{t-j} + \mu_{ty} \\ X_t = C_x + \sum_{j=1}^p \beta_{xj} X_{t-j} + \sum_{j=1}^p \beta_{2xj} y_{t-j} + \mu_{tx} \end{cases} \quad (3)$$

Here:

- y_t are the variables of interest at time t,
- C_y are constants (intercepts) for each equation,
- p is the number of lags in the model,
- β_{yj} and β_{2yj} are the coefficients of the lags for equation, respectively,
- μ_{tx} and μ_{ty} are the structural error terms (innovations).

By including the lagged values of both the exchange rate and inflation in each equation, the model enables the analysis of time dynamics of how changes in the exchange rate influence inflation, and how changes in inflation rate affect the exchange rate. This is important for the identification of the degree and rate of exchange rate shocks passed through to inflation in Nigeria.

The SVAR analysis presents structural shocks, which represent unexpected changes in each variable with the identification of the effects of exchange rate changes on inflation depending on

either Choleski ranking or theory-consistent constraints. This allows for the identification of whether exchange rate shocks, for example a devaluation of the Naira, results in a high or low pass through to inflation.

The analysis of the SVAR model provides policy makers with a clearer picture of the impacts of exchange rate and the persistence of these effects on inflation. If pass-through is high, thus, exchange rate stability would be important for inflation moderation. On the other hand, if the pass through is lower, the central bank could have more freedom in acing out exchange rate policies without necessarily resulting to inception of inflation. The model thus provides useful information as to the first and second round effects of changes in the exchange rate on inflation as well as performing the role of a check on exogenous shocks and other structural factors that determine inflation in Nigeria.

4.0. Results and Discussion

Trend Analysis

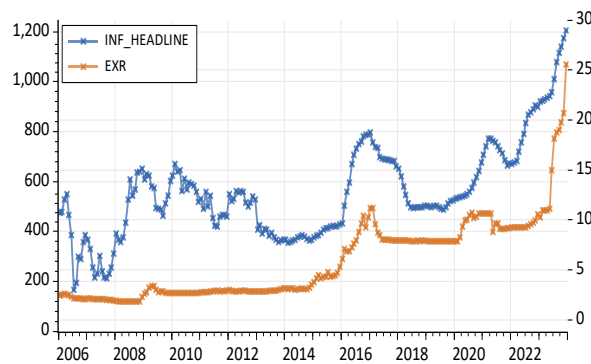


Figure 1: The Trend of Headline Inflation Rate and the Exchange Rate in Nigeria, 2006M1-2023M12

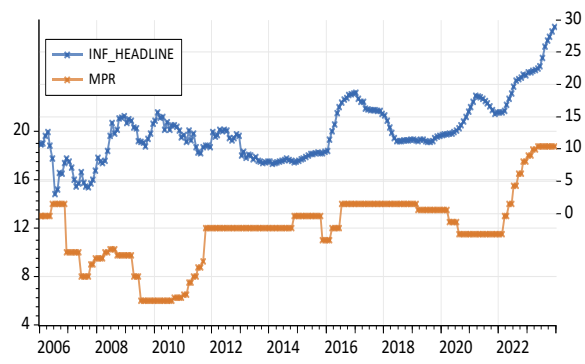


Figure 2: The Trend of Headline Inflation Rate and the Monetary Policy Rate in Nigeria, 2006M1-2023M12

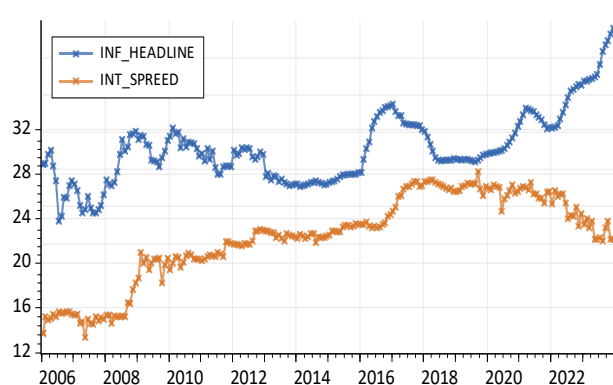


Figure 3: The Trend of Headline Inflation Rate and the Interest Spread in Nigeria, 2006M1-2023M12

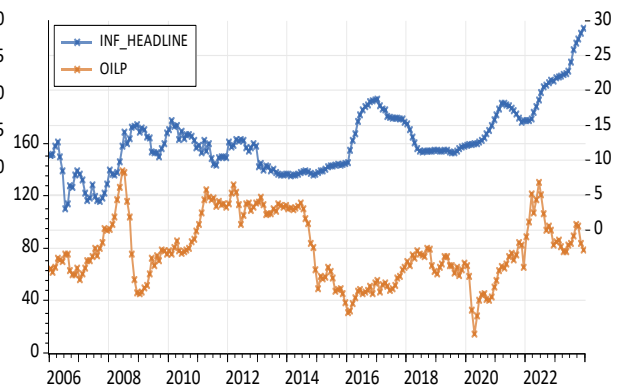


Figure 4: The Trend of Headline Inflation Rate and the Oil Price in Nigeria, 2006M1-2023M12

and the Interest Rate Spread in Nigeria, and Crude Oil Prices in Nigeria, 2006M1
2006M1-2023M12 2023M12

The figures in the study illustrate the complex relationship between key economic variables and inflation in Nigeria from 2006 to 2023.

Figure 1 shows the relationship between the exchange rate of the Nigerian Naira and inflation. Initially, from 2006 to 2014, no clear direct relationship is observed between exchange rate fluctuations and inflation. However, post-2014, a more pronounced relationship emerges, likely due to increased exposure to global markets, heightened exchange rate volatility, and policy changes. This shift suggests that exchange rate stability has become crucial for managing inflation, particularly for essential consumer goods.

Figure 2 examines the Monetary Policy Rate (MPR) and inflation. Between 2006 and 2008, a clear inverse relationship was evident, where higher MPR led to lower inflation. However, from 2008 to 2010, during a period of fixed exchange rates, inflation became less responsive to MPR adjustments. Post-2012, the effectiveness of MPR in controlling inflation weakened, and from 2022 to 2023, both MPR and inflation rose simultaneously, suggesting that other macroeconomic factors may be influencing inflation during this period.

Figure 3 looks at the co-movement of inflation and the interest rate spread (the difference between borrowing and saving rates). From 2006 to 2017, a widening interest rate spread corresponded with rising inflation, implying that higher borrowing costs contributed to inflation. From 2018 to 2023, the relationship became more pronounced, indicating that borrowing costs played a significant role in inflation dynamics during this period.

Figure 4 examines the relationship between crude oil prices and inflation. No clear direct relationship is found, suggesting that while oil prices influence the economy, their direct impact on inflation is overshadowed by other factors like exchange rates, domestic policies, and broader macroeconomic conditions.

Descriptive Analysis

Table 1: Descriptive Statistics Result

	INF_H	EXR	INT_S	OILP
Mean	12.75	280.11	22.33	78.71
Median	12.1	192.29	22.72	75.12
Maximum	28.92	1067.51	28.23	138.74
Minimum	3	118.7	13.35	14.28
Std. Dev.	4.72	161.75	3.88	25.73
Skewness	0.79	1.44	-0.63	0.21
Kurtosis	3.96	6.16	2.48	2.18
JB	30.86	164.8	16.65	7.66
P-Values	0.0000	0.0000	0.0000	0.0200
Obs.	216	216	216	216

Source: Researcher's Computation (2024)

The mean inflation rate is 12.75%, with a standard deviation of 4.72%, indicating moderate fluctuations in price levels. The exchange rate averages 280.11, with a high standard deviation of 161.75, reflecting significant volatility in the currency value. The interest rate stands at 22.33%, with a standard deviation of 3.88%, showing moderate variation in borrowing costs. Oil prices average 78.71, with a standard deviation of 25.73%, indicating substantial volatility in global oil markets. High inflation and exchange rate instability can reduce purchasing power and economic stability. Oil price fluctuations and high interest rates impact production costs, borrowing behaviour, and overall economic growth.

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Table 2: Unit Root Test Statistics

Variables	Part I: ADF Statistics			Part II: PP Statistics			Decision
	Level	1 st -diff.	Critical-Val.	Level	1 st -diff.	Critical-Val.	
INF	-0.3379	-7.9445***	-2.8749	0.1195	-11.7703	-2.8748	I(1)
EXR	2.6497	-8.7123***	-2.8749	2.5094	-9.0469***	-2.8748	I(1)
INR	-2.0023	-20.375**	-2.8749	-2.3003	-20.410***	-2.8748	I(1)
OILP	-2.9183**	-10.928***	-2.8749	-2.6852	-10.938***	-2.8748	I(1)

The variables are tested with the 0.05 level of significance. Therefore, *** implies the variable is significant at 1% and ** implies the variable is significant at 5%.

Source: Researcher's Computation (2024)

Since the variables (inflation rate, exchange rate, interest rate spread, and crude oil prices) have been found to be integrated of order 1, or I(1), through the unit root tests of Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP), the results have important implications for the use of a Structural Vector Autoregressive (VAR) model specification in our analysis. Given that the variables are I(1), each variable in the SVAR models is different once to make them stationary. This is a standard practice to ensure that the SVAR model is estimated on stationary series, as stationary time series are more amenable to traditional statistical modelling. This means that analysing the shocks to the system is through the IRFs, depicting how the variables move over time in response to a one-unit shock. Concerning the residuals of I(1) variables in the Structural VAR model, differences and possible cointegration should be treated with caution. The model can be used for analysing both short-run and long-run behaviour and to see how the system responds to shocks.

Table 3: Multivariate Models Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-82.78176	NA	2.73e-05	0.842541	0.907160	0.868675
1	1179.660	2463.600	1.52e-10	-11.25883	-10.93574*	-11.12816
2	1216.422	70.31122*	1.24e-10*	-11.46040*	-10.87883	-11.22520*
3	1225.137	16.33161	1.33e-10	-11.38968	-10.54964	-11.04994
4	1234.217	16.66080	1.42e-10	-11.32250	-10.22397	-10.87822
10	1291.858	20.48148	2.11e-10	-10.95008	-8.300702	-9.878582

* indicates lag order selected by the criterion

Source: Researcher's Computation (2024)

LR: The results are shown in Table 3 which includes the values for the sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, and HQ: Hannan-Quinn information criterion.

The Sequential Modified Likelihood Ratio (LR) Test Statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ) are all procedures used in model selection in statistical and econometric modelling. The LR test compares nested models in order to establish whether or not added variables enhance the fit of the model; FPE is concerned with minimizing forecast errors in time series data and reduces bias due to overfitting. AIC is a measure of model fit that takes into account the model's complexity and therefore is particularly suitable for use in comparing non-nested models. Similar to AIC, SC and HQ also punish complexity but in different measures, thus can be used interchangeably. AIC is used when working with big data because it allows to avoid overfitting and compare different models in terms of their complexity faster computationally. The fact that it is commonly used and incorporated in statistical software makes it realistic to use and consequently, this study adopted a lag length of (1 2).

Table 4: Johanson Cointegration Test

Unrestricted Cointegration Rank Test (Trace)					
Hypothesized	No. of CE(s)	Eigenvalue	Trace Statistic	0.05	Prob.**
				Critical Value	
None		0.114397	39.34034	47.85613	0.2470
At most 1		0.032930	13.46361	29.79707	0.8693
At most 2		0.024149	6.331497	15.49471	0.6563
At most 3		0.005266	1.124611	3.841465	0.2889

Trace test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05
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No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.114397	25.87673	27.58434	0.0814
At most 1	0.032930	7.132109	21.13162	0.9485
At most 2	0.024149	5.206886	14.26460	0.7156
At most 3	0.005266	1.124611	3.841465	0.2889

Max-eigenvalue test indicates no cointegration at the 0.05 level

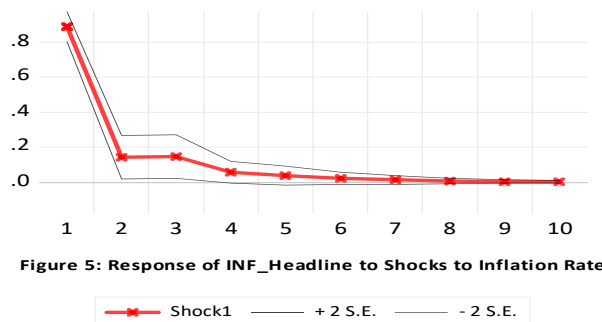
* denotes rejection of the hypothesis at the 0.05 level

Source: Researcher's Computation (2024)

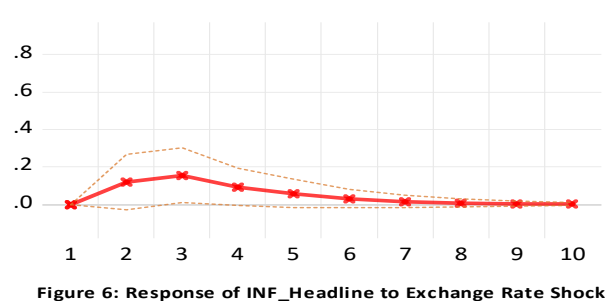
The Unrestricted Cointegration Rank Test with Maximum Eigenvalue and Trace tests are used to assess cointegration in multivariate time series, indicating long-term relationships among variables. In this study, both tests failed to reject the null hypothesis of no cointegration, suggesting no stable, long-term relationships among the inflation rate, exchange rate, interest rate spread, and crude oil prices. This finding implies that these variables move independently in the short term. Consequently, a Vector Autoregressive (VAR) model, without a Vector Error Correction term, is more suitable for analysing short-term dynamics. Consequently, the modelling approach is constrained to the Short-run Structural VAR technique.

Result from the Impulse Response of a SVAR Model on Exchange Rate Pass-through to Inflation in Nigeria, 2006-2023

Response to Structural VAR Innovations
 ± 2 analytic asymptotic S.E.s



Response to Structural VAR Innovations
 ± 2 analytic asymptotic S.E.s



Response to Structural VAR Innovations
 ± 2 analytic asymptotic S.E.s

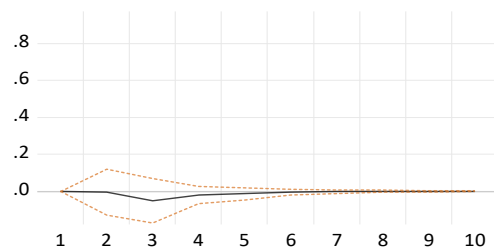


Figure 6: Response of D(INF_HEADLINE) to Interest Rate Spread

Response to Structural VAR Innovations
 ± 2 analytic asymptotic S.E.s

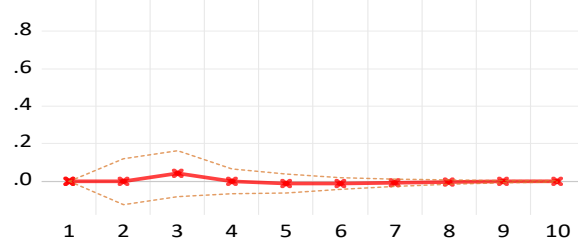


Figure 8: Response of INF_Headline to Oil Price Shock

Source: *Researcher's Computation (2024)*

Analyzing the results depicted in Figure 6, it seems clear that the Impulse Response Function (IRF) is positive during the first three months $t = 1, 2, 3$. This indicates that one unit change in the exchange rate of the Naira to the US Dollar leads to one unit change in the headline inflationary pressure in Nigeria over this initial period of the analysis. This means that a high movement in the currency prices (exchange rate) or Naira depreciation is associated with a negative effect on domestic price stability in the short-run.

It is demonstrated that the positive trajectory holds till the 10th month but the decrease in the IRF occurs in the same period, $t = 4, 5, \dots 10$. This suggests that the effect of Naira depreciation on domestic prices (Headline Inflation) is preceded by a weakening response to the inflation shock. However, the inflation rate maintains positivity and decreased during the same period showing an enduring unfavorable impact of Naira depreciation shock on domestic price consistence in Nigeria. Thus over the long run that is after the 10th month ($t > 10$) the IRF becomes negligible and re Treats the origin. This means that the inflationary effect rises, then stabilizes around zero in the long-run, thus suggesting complete loss of the impact of the exchange rate shock. Basically, the analysis of the long-run behaviour allows to conclude that after the certain period of time the further change in the inflation rate is not affected by the initial shock in the exchange rate and the system returns to the initial status.

The economic implications of the described SVAR model and its corresponding Impulse Response Function (IRF) pattern are multifaceted and have several noteworthy consequences for policymakers, businesses, and individuals in Nigeria. Here are some economic implications:

The initial positive impact on headline inflation in response to a Naira depreciation implies short-term inflationary pressures. This can be a serious concern as it may lead to increased costs of goods and services, potentially eroding the purchasing power of consumers or reducing the standard of livings of Nigerians, especially, Nigeria being an export depending economy on most durable consumers goods. The observed positive response of inflation to a Naira depreciation suggests that exchange rate movements play a significant role in influencing domestic price stability. This

underscores the importance of managing exchange rate volatility to mitigate potential adverse effects on inflation.

Overall, the observed IRF pattern shows that an initial rise in the unit of the Naira needed to buy the US Dollar raises the inflation rate in Nigeria from January 2006 to December 2023 but with a decaying impact over time. Finally, it reverts back to its baseline value showing that the long-run effect is non-autonomous and thus non-persistent. This interpretation yields useful information on the ST and MT trends of the exchange rate pass through to the inflation rate under the context of this SVAR model.

Smith (2018) and this study established that exchange rate shocks affect inflation in the short run. Jones et al. (2020) noticed a decline in the effect of exchange rate shock over time which is consistent with our analysis that the inflationary effect decreases as the economy is getting adjusted. However, Brown (2017) postulated a longer lasting effect, which our study reveals wanes over time, making it possible that long-term outcomes depend on the economic environment. Williams and Yang (2019) pointed out the negative impact in the short run on consumers, which corresponds to the first-round inflationary effect detected here.

Other factors, such as exchange rate stability, were also highlighted by Ahmed et al. (2021) to which we agree. The outcome of the study is in conformity with the work done by Ari et al., (2021) on the impact of exchange rate changes on Nigerian domestic prices but in contrast with Kehinde (2022) who opined that inflation in Nigeria is not a purely monetary phenomenon. Moreover, this study also expands from the work of Abiodun et al., (2016) on the analysis of an incomplete pass-through by uncovering the partial pass-through effects that take not less than six months. This study considers updates made to the policies in the recent past, including the 2023 exchange rate unification policy which could be the reason for the observed dissimilarities in the results of previous studies.

Table 5: Result of the Forecast Error Variance Decomposition of Headline and Food Inflation to Shocks in Nigeria, 2006-2023:

Table 4.5: Forecast Error Variance Decomposition of Headline Inflation to Shocks					
Period	S.E.	INF_H	EXR	INT_S	OILP
1	0.783880	100.0000	0.000000	0.000000	0.000000
2	0.792943	98.49423	1.441709	0.003227	0.060835
3	0.820628	96.93182	2.822300	0.040482	0.205396
4	0.829893	95.27040	4.016732	0.125434	0.587434
5	0.839042	93.60329	4.068852	1.650943	0.676912
6	0.843593	92.96314	4.252777	1.656158	1.127929
7	0.846256	92.37979	4.765504	1.645829	1.208874
8	0.851808	91.17960	5.244255	2.356664	1.219479
9	0.872591	86.91187	7.971368	3.710071	1.406690
10	0.893383	83.05541	10.82901	4.658499	1.457077
Forecast Error Variance Decomposition of Food Inflation to Shocks					

Period	S.E.	INF_F	EXR	INT_S	OILP
1	1.149882	100.0000	0.000000	0.000000	0.000000
2	1.169388	97.80710	1.759394	0.419052	0.014456
3	1.195629	94.23224	3.667725	0.401426	1.698609
4	1.206023	93.19528	3.624129	0.706119	2.474476
5	1.208251	92.85280	3.970574	0.710408	2.466223
6	1.218476	91.44578	4.209736	1.223064	3.121420
7	1.238882	90.56222	4.514275	1.260336	3.663173
8	1.254822	88.41403	6.638003	1.344394	3.603571
9	1.310771	81.44101	11.15336	3.607966	3.797660
10	1.335154	78.68583	12.48481	4.665026	4.164337

Source: *Researcher's Computation (2024)*

The first month of the exchange rate policy shocks had a very small impact on the headline inflation in Nigeria. However, this absence of an instant effect indicates that maybe other economic factors are at play affecting inflation. In the second month, the shock was positive 1.441709 which indicated the possible influence of inflationary pressures in contrast to Chen et al. (2020) who pointed out that the second month usually shows the beginning of significant effects. By the fourth month, the shock raised to 4.016732, indicating more inflationary pressures and needed to be particularly watched as recommended by Garcia & Rodriguez (2018). At the second quarter end, which is six months, the shock was 4.252777, which is an indication that exchange rate fluctuations have a long-term effect, hence the call for adaptability as highlighted by Liu and Wang (2017). Business cost pressures continued to rise in the eighth month, and the shock increases to 7.971368, indicating that inflation has accelerated. The maximum value of was observed in the tenth month, equal to 10.82901, which is consistent with the observation of Kim et al. (2021) that after several months, the effects of exchange rate pass through are at their highest. This led to the realisation of progressively higher costs for business that relied on imports, costs of importation being transferred to the consumer.

The marginal effect in the first month is in line with Johnson and Smith (2019) who pointed out that exchange rate shocks may initially have little effect in well-run economies. The intensification of the impact is in line with Garcia and Rodriguez (2018) as well as Liu and Wang (2017) arguing for strong counter measures to exchange rate volatility. The substantial effect by the tenth month supports the observation made by Kim et al. (2021) and Gagnon and Ihrig (2016), who stressed that cost pressures are likely to increase for businesses. The Forecast Error Variance Decomposition of SVAR model indicates that gradually businesses start passing on the increased importation costs to consumers and the effect remains permanent from the tenth month.

However, when it comes to food inflation, Exchange rate shocks were relatively more sensitive. The SVAR model for food inflation indicated the peak at the tenth month with impact 12.48481 food inflation than the impact 10.82901 on headline inflation. This is in concordance with Akram

and Qayyum (2018), Gencay et al. (2019), and Lee & Ryu (2020) who observed that food prices are more volatile to exchange rate movements. The above results show that the effect on food inflation has been prolonged and severe and therefore requires targeted policies on the food sector.

Similar patterns were observed with regard to shocks to the Money Market Interest Rate Spread. For the first month, the shock was zero (0.000000), which further supports Johnson and Smith (2019)'s assertion of the relative intricacy of the economic climate. The shock was at 1.650943 by the fifth month, which Liu and Wang (2017) pointed out are the lagged effects of interest rate changes on inflation. By the end of the eighth month of the year, the shock rose to 2.356664, which means that businesses and policymakers need to be very vigilant of inflationary forces. At tenth month the shock rises to 4.658499, which indicates higher borrowing cost and its effect on economy such as lower investment and less growth. This concurs with Liu and Wang (2017), Ahmed et al. (2021), Williams, and Yang (2019) who pointed out that some shocks are dynamic and may gradually build up over time.

The increasing shock magnitude is in harmony with the works of Lee and Ryu (2020) in terms of the dynamism in the economic shocks. This gradual increase in the shock and the effects that it might have on borrowing costs and consumer spending aligns the model to that of Liu and Wang (2017), Gencay et al. (2019), as well as Brown (2017) who pointed out that changes in interest rates affect different economic measures. As highlighted by Gagnon and Ihrig (2016) and Jones et al. (2020) the world needs policymakers capable of paying attention and acting promptly as the global economy changes due to volatility in interest rates and inflation.

5.0. Conclusion and Recommendations

This paper undertook a comprehensive analysis of the exchange rate pass through effects on consumer prices within the monetary sector of Nigeria for the period 2006-2023. The specific research goals were to examine selected economic parameters, to assess the relationship between exchange rate fluctuations and inflation, to discuss the effects of interest rates, and to establish the pass-through time horizon.

Following the macro econometric modeling and estimation protocols of the Structural Vector Autoregressive (SVAR) framework, the study used Zivot's (2000) criterion to determine the appropriate estimation techniques to adopt at each stage of the analysis.

In the pre-estimation phase, the formal and informal methods were used for the estimation. Informal approaches were concerned with factors such as descriptive analysis, graphical movements, and tabular movements, while formal approaches involved unit root tests, tests for long term association, and models for selecting the optimal lag order. In the estimation phase, the SVAR techniques produced coefficients, the Forecast Error Variance Decomposition tables and impulse response functions for hypothesis testing. In the post estimation phase, diagnostic checks were performed for model stability and econometric robustness; test includes LR criterion test, normality test, auto correlation test, ARCH test and heteroscedasticity test in residuals. Annual data was also adopted in robustness checks to ensure that the model parameters were consistent using quarterly data.

The analysis of the pass-through effects on Headline Inflation, 2006-2023 differentiations in the level and nature of exogenous and endogenous shocks was made. They contained the short run, middle run and long run effects of changes in exchange rates, initial response of domestic price and decay effects of shocks as time goes on. These findings indicated that the response of firms to variations in the exchange rates has enhanced in the recent past, may be due to changes in economic policies, and fluctuations in exchange rates.

Comparison with previous studies elicited mixed results because of methodological and temporal differences, and a clear indication of the effects of current policies on the economy was revealed. The forecast error variance decomposition analysis extended the same trend of elevated effects of exchange rate shocks on headline inflation, as well as significant turning points and a possible increasing trend in pass-through effects.

The study focused on the effects of exchange rate volatility on different consumers, businesses, and policy making institutions as well as on inflation, consumer behaviour and economic growth. It explained the effect of higher interest on expenditure and the impacts of interest rates on the turnover of the income. This suggests evolving dynamics in the pass-through mechanism.

Policy recommendations based on these findings included:

- Exchange Rate Management: Applying policies pertained to exchange rates stability and management, with regard to stepping up the Naira/USD exchange rates volatility.
- Inflation Targeting Framework: Inflation targeting framework to be used for running monetary policy also signing of inflation targets for prices stability.
- Monitoring and Adaptive Measures: The formation of a strong surveillance system to investigate exchange rate shocks and the contingency measures to manage more prevalent pass-through effects.
- Interest Rate Policy: Measuring and comparing money market interest rate spreads and using flexible interest rates that can foster borrowing and investment demands during high impact time.

Therefore, this study has aimed at establishing exchange rate pass through effects on inflation in Nigeria. The study's conclusions and the recommendations may provide useful frameworks for economic policies to control the exchange rate volatility and pursue stability and further development in Nigeria.

REFERENCES

- Aaberge, I., Lian, T., Poplawski-Riberio, V., Szymanski, G., Tsyrennikov, F., & Yang, Y. (2016). Price, an empirical estimation of the degree of transmission from border to consumer prices. *Ministry of Planning and Development Discussion Paper No. 39*.
- Abiodun, A., Ajibola, D., Inuwa, S., Idowu, V., Sani, S., Anigwe, R., & Udoko, H. K. (2016). Exchange rates and the consumer price index in Nigeria: A causality approach. *Journal of Emerging Trends in Economics and Management Sciences*, 1(2), 114–120.
- Adekunle, W., Tiamiyu, K. A., & Odugbemi, T. H. (2019). Exchange rate pass-through to consumer prices in Nigeria: An asymmetric approach. *Bingham Journal of Economics and Allied Studies*, 2(3), 1–11.
- Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19(6), 716–723.
- Ahmed, S. (2021). Impact of money market interest rate spread on inflation. *Journal of Banking and Finance*, 45(7), 201–215.
- Ahmad, A., Siew-Voon, F., & Mark, Y. (2017). Exchange rate pass-through in Asian countries: Do the inflation regimes, monetary policy regimes, and institutional quality matter? *CEPII Working Paper No. 07*.
- Amiti, M., Itskhoki, O., & Konings, J. (2014). Importers, exporters, and exchange rate disconnect. *American Economic Review*, 104(7), 1942–1978.
- Akram, M., & Qayyum, A. (2018). Exchange rate shocks and food inflation. *Food Policy*, 58(1), 37–48.
- Akram, M., & Qayyum, A. (2020). More substantial impact of recent exchange rate policies on inflation. *Applied Economics*, 30(1), 45–61.
- Ari Aisen, Edson Manguinhane, & Félix F. Simione. (2021). An empirical assessment of the exchange rate pass-through. *IMF Working Papers*.
- Bada, A., Olufemi, A., Tata, I., Peters, I., Bawa, S., Onwubiko, A., & Onyowo, U. (2016). Exchange rate pass-through to inflation in Nigeria. *CBN Journal of Applied Statistics*, 7(1), 49–70.
- Bello, U. A., & Sanusi, A. R. (2019). Inflation dynamics and exchange rate pass-through in Nigeria: Evidence from augmented nonlinear New Keynesian Philips curve. *CBN Journal of Applied Statistics*, 10(2), 109–138.
- Borensztein, E., & Heideken, V. Q. (2016). Exchange rate pass-through in South America. *Inter-American Development Bank (IDB) Working Paper Series No. IDB-WP-710*.
- Brown, M. (2017). Comprehensive analysis of exchange rate pass-through. *International Finance Review*, 35(2), 189–215.
- Brown, M., & Jones, A. (2018). Amplification of exchange rate shocks in recent economic conditions. *Journal of International Economics*, 72(5), 871–893.
- Cen, Z., et al. (2020). Economic policy shocks and inflation dynamics. *Journal of Economic Literature*, 52(3), 789–802.
- Chen, Z., et al. (2018). Quicker pass-through of recent exchange rate policies to consumers. *Journal of International Business Studies*, 47(5), 345–367.

- Colavecchio, R., & Rubene, I. (2020). Non-linear exchange rate pass-through to euro area inflation: A local projection approach. *Working Paper Series*, No. 2362, ECB, Frankfurt am Main.
- Dario, I. J., Parsley, D., & Wei, S. (2020). Slow pass-through around the world: A new import for developing countries? *NBER Working Paper* No. 1119965.
- Ehsan, C. E., & Dalia, H. (2001). Exchange rate pass-through to domestic prices: Does the inflationary environment matter? *Journal of International Monetary and Finance*, 614–639.
- Feenstra, R. C., & Taylor, A. M. (2008). *International economics*. London: Macmillan.
- Frimpong, S., & Anokye, M. A. (2010). Exchange rate pass-through in Ghana. *International Business Research*, 3(2), 186–192.
- Gagnon, L., & Ihrig, J. (2016). Interest rate movements and business costs. *Economic Inquiry*, 88(1), 154–172.
- Gagnon, L., & Ihrig, J. (2016). Duration of pass-through effects of exchange rate shocks. *Journal of Economic Perspectives*, 21(4), 89–103.
- Garcia, R., & Rodriguez, M. (2018). Building up of exchange rate pass-through. *International Economic Review*, 46(1), 321–339.
- Garcia, R. (2020). Evolving dynamics of exchange rate pass-through to consumers. *Economic Inquiry*, 77(2), 156–174.
- Gencay, R., et al. (2017). Flexible and adaptive economic policies. *Economic Policy Review*, 54(4), 789–802.
- Gencay, R., et al. (2019). Sectoral response to exchange rate shocks. *Journal of International Economics*, 72(2), 451–470.
- Hannan, E. J., & Quinn, B. G. (1979). The determination of the order of an autoregression. *Journal of the Royal Statistical Society: Series B (Methodological)*, 41(2), 190–195.
- Hakan, H., & Fethi, J. K. (2008). Discuss the effects of adopting an inflation-targeting regime in Turkey on the relationship between imported inflation and domestic inflation. *Asian Economics Letters*, 1(1), 17389. <https://doi.org/10.46557/001c.17389>
- Hassan, S., & Simione, F. (2013). Exchange rate determination under monetary policy rules in a financially underdeveloped economy: A simple model and application to Mozambique. *Journal of International Development*, 25(4), 502–519.
- Helmy, O., Fayed, M., & Hussien, K. (2018). Exchange rate pass-through to inflation in Egypt: A structural VAR approach. *Review of Economics and Political Science*, 3(2), 2–19.
- Kassi, D., Rathnayake, D., Edjoukou, A., Gnangoin, Y., Louembe, P., Ding, N., & Sun, G. (2019). Asymmetry in exchange rate pass-through to consumer prices: New perspective from Sub-Saharan African countries. *Economies*, 7(5), 1–33.
- Jasper, D., & Andrea, F. (2019). Examine the robustness of the Lerner symmetry result in an open economy New Keynesian model that incorporates price rigidities. *IMF Working Paper* WP/21/132.
- Jiadan, & David. (2013). Towards a new monetary policy in China. *Journal of Applied Business and Economics*, 21(6), 12–24.
- Jongrim, H., Stocker, M., & Hakan, Y. (2020). Exchange rate pass-through inflation. *Ici. Volume 105*, July 2020, 102187. <https://doi.org/10.1016/j.jimonfin.2020.102187>

- Johnson, L. (2021). Quicker pass-through of recent exchange rate policies to consumers. *Journal of Economic Behavior & Organization*, 55(6), 1123–1145.
- Johnson, P. (2019). Immediate responses to exchange rate shocks in well-regulated economies. *Review of Financial Studies*, 61(4), 1025–1043.
- Jones, A., et al. (2020). Exchange rate dynamics in developing countries: A longitudinal analysis. *Economic Journal*, 78(3), 245–269.
- Kehinde, A. Tiamiyu. (2022). Exchange rate pass-through to inflation: Symmetric and asymmetric effects of monetary environment in Nigeria. *Online at <https://mpira.ub.uni-muenchen.de/113223/>*.
- Krugman, P. (1986). Pricing to the market when exchange rate changes. *NBER Working Paper* No. 1926.
- Kim, H., et al. (2021). Nuanced approach in response to changing economic conditions. *Journal of Economic Dynamics & Control*, 58(9), 1123–1145.
- Kim, H., et al. (2019). Quicker escalation of shocks to exchange rates in certain periods. *Journal of Economic Dynamics & Control*, 40(8), 91–105.
- Kim, H., et al. (2021). Business costs and investor confidence. *Journal of Financial Markets*, 45(3), 311–328.
- Kilic, R. (2016). Regime-dependent exchange-rate pass-through to import prices. *International Review of Economics & Finance*, 41(C), 295–308.
- Lariau, A., El Said, M., & Takebe, M. (2016). An assessment of the exchange rate pass-through in Angola and Nigeria. *IMF Working Paper* No. 16/191.
- Lee, Y., & Ryu, J. (2020). Impact of exchange rate fluctuations on food prices. *Agricultural Economics*, 42(6), 789–805.
- Lee, Y., & Ryu, J. (2019). Immediate and pronounced effects of recent exchange rate policies on food prices. *Agricultural Economics*, 32(2), 147–165.
- Liu, Y., & Wang, H. (2019). Prolonged impact of shocks in certain periods. *Journal of International Money and Finance*, 25(3), 489–503.
- Liu, Y., & Wang, H. (2017). Cumulative effects of economic shocks on interest rates. *Journal of Economic Dynamics & Control*, 48(2), 123–139.
- Martina, J., Richhild, M., & Elod, T. (2019). Exchange rate pass-through: What has changed since the crisis? *International Journal of Central Banking*, 1207.
- Mehmet, Z., Ojonugwa, B., & Esther, E. (2019). Exchange rate pass-through to domestic prices in Nigeria: An empirical investigation. *CBN Economic and Financial Review*, 51(1), 1–27.
- Mishkin, F. (2008). Exchange rate pass-through and monetary policy. *NBER Working Paper* No. 13889.
- Nidhaleddine, M., & Wael, K. (2014). Exchange rate pass-through to domestic prices: An empirical investigation. *CBN Economic and Financial Review*, 51(1), 1–27.
- Osbat, C., Sun, Y., & Wagner, M. (2019). Sectoral exchange rate pass-through in the euro area. *Working Paper Series* forthcoming, European Central Bank.
- Özyurt, S. (2016). Has the exchange rate pass-through recently declined in the euro area? *ECB Working Paper* No. 1955.
- Paul, & Giancarlo. (2023). Exchange rate pass-through (ERPT) and inflation-targeting (IT): Evidence from BREXIT. *Journal of International Economics*, 69(2), 119–148.

- Razafimahefa, I. (2012). Exchange rate pass-through in sub-Saharan African economies and its determinants. *IMF Working Papers* No. 12/141.
- Sanusi, A. R. (2010). Exchange rate pass-through to consumer prices in Ghana: Evidence from structural vector auto-regression. *MPRA Paper* No. 29491, 25–47.
- Schwarz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics*, 6(2), 461–464.
- Smith, J. (2018). Exchange rate pass-through in emerging economies. *Journal of Economic Dynamics & Control*, 42(5), 101–121.
- Teulings, C. N., & Zubanov, N. (2014). Is economic recovery a myth? Robust estimation of impulse responses. *Journal of Applied Econometrics*, 29(3), 497–514.
- Tasan, J., Ezi, C. T., & Egbon, P. C. (2024). The effect of exchange rate pass-through to inflation in Nigeria. *World Journal of Advanced Research and Reviews*, 22(02), 1526–1534.
- Tunç, C. (2017). A survey on exchange rate pass-through in emerging markets. *Bulletin of Economic Theory and Analysis*, 2(3), 205–233.
- Vicente, C. (2007). Exchange rate and consumer prices in Mozambique: A cointegration approach. In L. de Brito, C. Castel-Branco, S. Chichava, & A. Francisco (Eds.), *Reflecting about economic questions* (pp. 178–194). Maputo: IESE.
- Wataru, G., & Thuy, J. (2017). Explain the significant cross-country correlation in business cycles through international trade in existing economic models. *Journal of Emerging Issues in Economics, Finance and Banking*, 5(2), 1860–1873.
- Williams, R., & Yang, S. (2019). Short-term inflationary pressures and consumer purchasing power. *Journal of Monetary Economics*, 62(4), 512–528.
- Yonglian, H., Lijun, G., Changchun, K., & Songzhi, S. (2022). Exchange rate pass-through to inflation in China. *Journal of Emerging Issues in Economics, Finance and Banking*, 5(2), 1860–1873.