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Impact of Petroleum Subsidy Withdrawal on Agricultural Sector Output Prices in Nigeria: 1996–2025

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ABSTRACT
Nigeria's withdrawal of petroleum subsidy in May 2023 marked one of the most consequential energy-policy reforms in the country's recent economic history, exposing domestic fuel prices to global market forces and provoking sharp increases in the pump price of petrol. Given the centrality of fuel to agricultural mechanisation, irrigation, processing and haulage, this article investigates the effect of the reform on agricultural sector output prices in Nigeria over the period 1996 to 2025. Employing the Autoregressive Distributed Lag (ARDL) bounds-testing approach on annual time-series data, the study models agricultural output price as a function of fuel price, exchange rate, inflation and money supply. An ARDL (2,1,2,0,2) model, selected on the Akaike Information Criterion, explains the data closely (R^2 = 0.998), but the bounds test statistic (F = 3.357) falls between the lower and upper critical bounds, yielding an inconclusive verdict on long-run cointegration, and the error-correction term, while correctly negative, is not statistically significant. Fuel price carries a positive short-run and long-run coefficient, consistent with cost-push theory, but neither is statistically significant; only the contemporaneous exchange rate coefficient is significant in the short run. Diagnostic testing further reveals heteroskedasticity and functional-form misspecification, and parameter stability tests suggest some instability in the later part of the sample, coinciding with the 2023 reform. The findings indicate that the relationship between petroleum subsidy withdrawal and agricultural output prices in Nigeria, while directionally consistent with theoretical expectation, is not yet statistically well established with the present specification, and the article closes with methodological and policy recommendations accordingly.
Keywords: petroleum subsidy withdrawal, agricultural output prices, ARDL bounds test, fuel price, Nigeria

1.0 INTRODUCTION

Petroleum subsidy occupied a central place in Nigeria's energy and economic policy for close to five decades. Under the subsidy regime, government absorbed the difference between the landing cost of imported refined products and the administratively fixed pump price, a fiscal commitment intended to shield households and productive sectors from the volatility of global oil markets. Sani and Kouhy (2014) characterise this arrangement not as a passive pricing decision but as an active fiscal obligation that inevitably carries macroeconomic consequences once deregulation is contemplated. Their framing anticipated much of what has since unfolded: by the early 2020s, the escalating cost of subsidy, driven by

Nigeria's limited domestic refining capacity and heavy reliance on imported fuel, had rendered the policy fiscally unsustainable, absorbing an estimated ₦3 trillion annually and crowding out investment in agriculture, infrastructure and education Sabiu, and Magaji, (2024).

The culminating episode came on 29 May 2023, when the newly inaugurated administration announced the end of the fuel subsidy regime. Pump prices rose sharply within weeks, with knock-on effects across transportation and production costs. Because petroleum products are a critical input for land preparation, irrigation, processing, storage and the movement of produce from rural farms to urban markets, the agricultural sector was among the most directly exposed to the reform. Rising fuel costs raise the cost of moving fertiliser, seed and agrochemicals to farm gates, while the running costs of fuel-powered equipment rise across the value chain, exerting cumulative upward pressure on the prices of food and agricultural commodities.

This cost-push dynamic is reinforced by the structure of petroleum demand in Nigeria. Abdullahi and Sani (2021) estimated the price and income elasticities of domestic petroleum consumption using the Johansen cointegration and Vector Error Correction Model over 1985–2018, finding petroleum consumption to be both price inelastic (long-run elasticity of −0.212) and income inelastic (long-run elasticity of 0.293). Nigerian producers, including those in agriculture, therefore do not meaningfully reduce fuel consumption when prices rise; instead, higher costs are absorbed into operations, which would theoretically be expected to raise the prices at which farm outputs are sold. Whether this theoretical channel is empirically detectable in Nigeria's agricultural output price data is the central question this article investigates.

Despite the prominence of subsidy withdrawal in Nigeria's policy discourse, empirical studies that isolate its effect on agricultural sector output prices, as distinct from aggregate food inflation, remain limited, and results in the wider literature are not uniformly conclusive. This article addresses that gap by examining the short-run and long-run effects of petroleum subsidy withdrawal, alongside exchange rate, inflation and money supply, on agricultural sector output prices in Nigeria between 1996 and 2025, using a rigorous ARDL bounds-testing framework with full diagnostic testing.

2. Literature and Theoretical Context

2.1 Petroleum Subsidy and Agricultural Prices

Petroleum subsidy in Nigeria evolved from a redistributive instrument, intended to channel oil wealth to citizens through affordable fuel, into one of the most costly forms of government intervention in the economy. Evidence from the Nigeria Extractive Industries Transparency Initiative indicates that over ₦3.92 trillion was spent on petrol subsidy between January 2020 and June 2022 alone, a sum exceeding combined federal allocations to agriculture, healthcare, education and defense over the same period. Critics have long argued that subsidy benefits accrued disproportionately to higher-income households and large commercial consumers rather than the poor the policy ostensibly targeted (Francis & Lucas, 2023), a finding that undermined the welfare case for retaining the regime.

Agricultural output prices, meanwhile, are shaped by the interaction of production costs, input prices, seasonal variation, market infrastructure and macroeconomic conditions such as inflation and exchange rate movements (Oseni & Oladele, 2018). Because agricultural supply and demand tend to be inelastic in the short run, even modest cost shocks can generate disproportionately large price movements (FAO, 2011). Fuel occupies a particularly prominent position among the macroeconomic determinants of agricultural prices because it powers mechanisation, irrigation, processing equipment and the transportation of inputs and outputs; consistent with price transmission theory, cost increases at the farm level are expected to propagate upward through wholesale and retail markets (Meyer & von Cramon-Taubadel, 2004; Bariki, Matthew & Ismail, 2025)), though the strength and statistical detectability of this transmission varies considerably across studies and contexts.

2.2 Theoretical Framework

The study draws on two complementary theories. Cost-Push Inflation Theory holds that increases in the cost of key inputs, including energy, lead producers to raise output prices to preserve margins (Blanchard, 2017); in the Nigerian context, fuel is a major cost component of land preparation, irrigation, processing, storage and transportation, so subsidy withdrawal would be expected to transmit into higher agricultural output prices. Price Transmission Theory explains how shocks originating in upstream markets, such as energy, pass through to downstream markets, with the extent and speed of transmission depending on market structure, transportation costs and institutional efficiency (Meyer & von Cramon-Taubadel, 2004). Together, the two theories provide the analytical scaffolding for the empirical model that follows, while also cautioning that pass-through is conditional rather than automatic, and may not always be statistically detectable within a given sample.

2.3 Empirical Review

Sani (2014a) conducted one of the most comprehensive empirical analyses of petroleum subsidy withdrawal in Nigeria, using a Vector Autoregression framework to examine the effect of subsidy-induced oil price changes on gross domestic product, inflation, unemployment and minimum wage. The study found that petroleum price changes were a major source of variation in inflation and output; although agriculture was not its direct focus, the documented inflationary effects imply a plausible cost-push channel for a sector so reliant on fuel-dependent transportation and distribution. In a companion theoretical paper, Sani (2014b) develops a taxonomy of downstream oil market deregulation and subsidisation, classifying countries by resource endowment and refining capacity and showing that the economic consequences of deregulation are conditional on whether a country is a net oil exporter or importer and on its refining capacity. Nigeria's position as an oil-producing country with historically limited refining capacity places it, in Sani's (2014b) taxonomy, among the cases with the greatest theoretical exposure to subsidy-withdrawal cost shocks, even where such exposure is difficult to isolate empirically in aggregate sectoral data. Sani and Kouhy (2014) extend this line of enquiry empirically, finding that deregulation of the downstream oil sector affects gross domestic product and employment in Nigeria, a result that, read together with Abdullahi and Sani's (2021) evidence of inelastic petroleum demand, motivates the present study's expectation that fuel price shocks could transmit into sectoral costs even where aggregate demand does not adjust.

Beyond these foundational studies, Sani's later work extends the analysis of oil-price shocks across a wider range of macroeconomic outcomes relevant to the present study. Sani and Ahmad (2016) assessed the effect of the fall in the global oil price on the naira exchange rate, finding a significant relationship between international crude oil price movements and domestic currency depreciation, a result that is echoed in the present study's own short-run finding that exchange rate, rather than fuel price itself, is the variable most clearly and immediately associated with agricultural output price movements. More recently, Sani and Koledoye (2025) examined domestic oil price variation and economic performance in Nigeria, Sani and Olaniyi (2025) and Bariki, Emmanuel and Ismail, (2025) investigated the effect of electricity supply on unemployment, and Sani and Lateef (2021) analysed the nexus between natural gas consumption and economic growth; together, these studies situate the present article's focus on fuel and agricultural prices within a broader Sani research programme on energy, macroeconomic performance and labour-market outcomes in Nigeria. Most directly relevant, Sabiu, Ajayi & Ismail, (2025) examined the effect of petroleum subsidy withdrawal on employment in Gwagwalada, Federal Capital Territory, finding that the 2023 reform was associated with measurable local employment effects, illustrating that subsidy withdrawal's consequences are often easier to detect at a disaggregated or local level than in aggregate national time series of the kind used in the present study. Bariki, Akhigbe and Ismail (2025) further extended this energy-focused agenda to environmental outcomes, examining the impact of oil spillage on climate change in Nigeria, underscoring that the consequences of Nigeria's petroleum sector extend beyond price and income effects to environmental dimensions that lie outside the scope of the present study.

Njoku, Goodwilson and Igbani (2025) found that Premium Motor Spirit and household kerosene prices exert a positive and significant effect on inflation in Nigeria, and Omang, Ogbo and Ogbaji (2025) found a positive and significant relationship between fuel price increases and food inflation in both the short and long run. At the sub-national and commodity level, Meludu, Komolafe and Chilaka (2024) documented statistically significant increases in the prices of rice, beans, garri and yam in south-eastern Nigeria following subsidy withdrawal, Muhammed, Hassan and Marafa (2024) reported comparable effects in Sokoto Metropolis, and Okwoli, Dutse and Adegbe (2025) linked fuel subsidy removal to higher tomato output prices in Kano State. These commodity- and location-specific studies, together with Nwosu's (2025) ARDL bounds-testing analysis of petroleum product prices and agricultural output over 1990–2024, form the backdrop against which the present study's more cautious, aggregate-level national findings should be read.

Exchange rate and monetary channels also feature prominently in the literature. Daniel and Tosin (2020) found that exchange rate movements have a positive and significant relationship with Nigerian agricultural commodity prices, while Muhammed (2024) showed that money supply expansion raises food prices even as it can reduce agricultural productivity. Cross-country evidence from Arze del Granado, Coady and Gillingham (2012) indicates that economies with high import dependence, a description that fits Nigeria's refining shortfall closely, experience stronger fuel-price pass-through to food markets, though the strength of this transmission is not automatic and depends heavily on market structure and macroeconomic conditions prevailing at the time. Taken together, the empirical literature supports the theoretical expectation that subsidy withdrawal transmits into agricultural prices through a combination of direct fuel-cost and indirect macroeconomic channels, an expectation this article tests directly and rigorously.

3. Materials and Methods

3.1 Research Design and Data Sources

The study adopts an ex-post facto, quantitative time-series research design suited to analysing a policy event, petroleum subsidy withdrawal, that had already occurred and could not be experimentally manipulated. Annual secondary data covering 1996–2025 (30 observations) were obtained from the Central Bank of Nigeria Statistical Bulletin, the National Bureau of Statistics, and related official publications. Five variables were used: Agricultural Sector Output Price (AP, index), Fuel Price (FP, ₦/litre of PMS, proxy for subsidy withdrawal), Exchange Rate (EXR, ₦/US$), Inflation Rate (INF, %), and Broad Money Supply (MS, ₦'billion).

3.2 Model Specification

Guided by cost-push inflation theory and price transmission theory, agricultural sector output price was specified as a function of fuel price, exchange rate, inflation and money supply: APt = f(FPt, EXRt, INFt, MSt). The ARDL representation of this relationship allows agricultural output price to depend on its own lags and on current and lagged values of the explanatory variables, with an error-correction term incorporated once the order of integration of the series had been established, allowing the model to capture both short-run adjustment and long-run equilibrium, contingent on evidence of cointegration.

3.3 Estimation Technique

Descriptive statistics were first computed, followed by Phillips–Perron (PP) unit root tests to establish the order of integration of each series, a precondition for the ARDL approach, which accommodates a mixture of I(0) and I(1), but not I(2), variables. Optimal lag length was selected using the Akaike Information Criterion (AIC) via a Vector Autoregression lag-order selection procedure, after which the ARDL model was estimated and the ARDL bounds test applied to test for the existence of a long-run equilibrium relationship among the variables. Short-run dynamics were examined through an error-correction representation, and model adequacy was assessed using the Breusch–Godfrey serial correlation LM test, the Breusch–Pagan–Godfrey heteroskedasticity test, and the Ramsey RESET test for functional-form misspecification, alongside CUSUM and CUSUM of Squares tests for parameter stability. All estimation was carried out in EViews 9.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 1: Descriptive Statistics of Study Variables

Variable	Mean	Median	Std. Dev.	Skewness	Kurtosis	J-B	Prob.
AP	146.26	102.27	168.53	2.737	10.248	103.12	0.000
FP	141.17	67.50	198.63	2.656	9.386	86.26	0.000
EXR	268.12	155.54	299.37	2.965	12.140	148.38	0.000
INF	14.32	12.82	6.74	1.214	4.094	8.87	0.012
MS	21,054.41	12,927.50	23,248.16	1.204	3.527	7.59	0.022

Source: EViews 9 output

All five series are positively skewed and, with the exception of inflation and money supply, strongly leptokurtic, and the Jarque–Bera test rejects normality at level for every variable ($p < 0.05$), reflecting the substantial structural change, naira depreciation and policy reversals that characterised the Nigerian economy over 1996–2025, most notably the 2023 subsidy withdrawal itself. Fuel price and agricultural output price in particular show very wide ranges relative to their means, consistent with the sharp, discrete jumps that accompanied successive subsidy reforms rather than smooth, continuous change.

4.2 Unit Root Testing

Table 2: Phillips–Perron Unit Root Test

Variable	PP Statistic (Level)	PP Statistic (1st Diff.)	5% Crit. Value	Order of Integration
AP	5.755	−2.685	−2.976	I(1), 10% level
FP	1.462	−4.732	−2.976	I(1)
EXR	7.016	12.535	−2.976	Ambiguous
INF	−3.184	−7.940	−2.976	I(0)
MS	3.858	−3.679	−2.976	I(1)

Source: EViews 9 output

Inflation is stationary at level, I(0). Fuel price and money supply are non-stationary at level but stationary after first differencing, I(1). Agricultural output price is stationary after first differencing only at the 10% level, a comparatively weak result. The exchange rate series produced an ambiguous PP statistic at first difference, a pattern attributable to the incomplete published exchange rate series for several years in the sample, for which values were estimated by linear interpolation, as noted in the study's limitations; this ambiguity should be borne in mind when interpreting results involving exchange rate. Since no variable is integrated of an order higher than one, the ARDL bounds-testing approach remains appropriate, though the weak and ambiguous unit root results for AP and EXR respectively are a first indication that the subsequent cointegration results should be interpreted with caution.

4.3 Lag Order Selection

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−854.81	NA	3.23E+20	61.415	61.653	61.488
1	−686.53	264.44	1.20E+16	51.181	52.608*	51.617
2	−649.98	44.38*	6.36E+15*	50.356*	52.973	51.156*

*Source: EViews 9 output. * indicates lag order selected by the criterion.*

The AIC and Hannan–Quinn criteria selected a maximum lag of two, while the Schwarz criterion favoured a more parsimonious lag of one; consistent with the AIC, the ARDL model was estimated allowing a maximum of two lags on each variable, with the automatic selection procedure settling on ARDL(2,1,2,0,2).

4.4 ARDL Model Estimation

The automatically selected ARDL(2,1,2,0,2) specification, with agricultural output price as the dependent variable, achieved a very high overall fit ($R^2 = 0.998$, adjusted $R^2 = 0.996$, $F = 659.91$, $p = 0.000$, Durbin–

Watson = 1.883), indicating that the included regressors and their lags jointly explain almost all the variation in agricultural output price over the sample, though such a high R^2 in a small, trending annual sample can also reflect shared trends among the series rather than a well-identified structural relationship, a possibility investigated further through the diagnostic tests reported below.

4.5 ARDL Bounds Test for Cointegration

Table 4: ARDL Bounds Test Results

F-statistic	Significance	I(0) Bound	I(1) Bound
3.357	10%	2.45	3.52
	5%	2.86	4.01
	2.5%	3.25	4.49
	1%	3.74	5.06

Source: EViews 9 output. k = 4.

The computed F-statistic of 3.357 falls between the lower I(0) bound (2.86) and the upper I(1) bound (4.01) at the 5% level of significance. This places the result in the inconclusive region of the bounds test: the null hypothesis of no long-run relationship can neither be confidently rejected nor confidently accepted on the basis of this test alone. This is a materially different outcome from studies such as Nwosu (2025), which reported a clear rejection of the no-cointegration null using an equivalent ARDL bounds-testing framework, and suggests that the long-run relationship among agricultural output price, fuel price, exchange rate, inflation and money supply is, at best, weakly supported by the present data and specification.

4.6 Short-Run Error Correction Model

Table 5: Short-Run ARDL Error Correction Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AP(-1))	−0.5396	0.4588	−1.176	0.257
D(FP)	0.0202	0.1377	0.147	0.885
D(EXR)	0.5594	0.1574	3.555	0.003
D(EXR(-1))	−0.4075	0.2468	−1.651	0.118
D(INF)	−0.4770	0.7138	−0.668	0.514
D(MS)	−0.0034	0.0019	−1.820	0.088
D(MS(-1))	0.0033	0.0015	2.228	0.041
CointEq(-1)	−0.1729	0.3049	−0.567	0.579

Source: EViews 9 output.

Of the short-run regressors, only the contemporaneous change in exchange rate is statistically significant (p = 0.003), positive and moderately large, indicating that naira depreciation is associated with a fairly immediate rise in agricultural output price. The lagged change in money supply is weakly significant (p = 0.041). Fuel price, whether contemporaneous or lagged, is not statistically significant in the short run, contrary to the direct cost-push transmission hypothesised in Section 2.2. The error-correction term, CointEq(−1), is correctly negative in sign (−0.173) but is not statistically significant (p = 0.579), reinforcing the inconclusive bounds test result: there is insufficient statistical evidence that deviations from any implied long-run relationship are being systematically corrected within the sample period.

4.7 Long-Run ARDL Coefficients

Table 6: Long-Run ARDL Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FP	1.7043	2.5806	0.660	0.518
EXR	1.7846	3.5345	0.505	0.621
INF	−2.7589	7.3584	−0.375	0.713
MS	−0.0100	0.0240	−0.418	0.681
C	−113.918	271.140	−0.420	0.680

Source: EViews 9 output.

None of the long-run coefficients is statistically significant at conventional levels. Fuel price and exchange rate both carry positive signs, consistent with cost-push theory, while inflation and money supply carry negative signs, contrary to prior expectation, though none of these coefficients can be distinguished from zero with any confidence given the associated standard errors. Combined with the insignificant error-correction term, this indicates that a stable, statistically identifiable long-run relationship between petroleum subsidy withdrawal and agricultural output price cannot be confirmed from the present ARDL specification.

4.8 Diagnostic Tests

Table 7: Model Diagnostic Tests

Test	Statistic	Prob.	Conclusion
Breusch–Godfrey Serial Correlation LM	F = 0.158	0.697	No serial correlation
Breusch–Pagan–Godfrey Heteroskedasticity	F = 5.876	0.001	Heteroskedasticity present
Ramsey RESET (functional form)	F = 13.121	0.003	Misspecification indicated
CUSUM / CUSUM of Squares	—	—	Instability in later sub-period

Source: EViews 9 output.

The model passes the Breusch–Godfrey test, showing no evidence of residual serial correlation. However, the Breusch–Pagan–Godfrey test indicates significant heteroskedasticity, and the Ramsey RESET test rejects the null of correct functional-form specification, together suggesting that a linear ARDL specification may not fully capture the underlying relationship, possibly because the effect of subsidy withdrawal on agricultural prices is nonlinear or asymmetric, larger for price increases than for decreases, a pattern that a standard linear ARDL model is not designed to detect. The CUSUM and CUSUM of Squares plots further point to parameter instability concentrated in the later part of the sample, broadly coinciding with the 2023 reform, consistent with a structural break that the current specification does not explicitly model.

4.9 Discussion in Relation to the Literature

Taken as a whole, the results offer only qualified support for the theoretical expectation, grounded in cost-push and price transmission theory, that petroleum subsidy withdrawal raises agricultural sector output prices in Nigeria. The positive sign on both the short-run and long-run fuel price coefficients is directionally consistent with Njoku, Goodwilson and Igbani (2025), Omang, Ogbo and Ogbaji (2025), Oyinlola, Adeniyi and Raheem (2020) and Akinlo and Apanisile (2019), all of whom report a positive and statistically significant effect of fuel price increases on food prices or inflation in Nigeria. However, unlike these studies, neither coefficient in the present model reaches statistical significance, and the ARDL bounds test itself yields an inconclusive verdict on cointegration, a materially weaker result than the significant long-run relationship reported by Nwosu (2025) using an equivalent bounds-testing framework over a similar period.

This divergence should not be read as evidence that subsidy withdrawal has no economic consequence for agriculture. Sani (2014a) demonstrated, using Vector Autoregression, that petroleum price changes were a major source of variation in Nigerian inflation and output at the aggregate level, and Sani, Ajayi and Ismail (2025) found measurable local employment effects of the 2023 subsidy withdrawal in Gwagwalada, FCT; both results suggest the reform's consequences are real but may be easier to detect in disaggregated, localised or higher-frequency data than in a 30-observation annual national series of agricultural output prices. Sani and Ahmad's (2016) finding that oil price movements significantly affect the naira exchange rate is, in this respect, more directly corroborated by the present study, whose one statistically robust short-run result is the significant, positive effect of exchange rate on agricultural output price; this suggests that, within this dataset, the exchange rate channel is a more empirically detectable transmission route for petroleum-sector shocks into agricultural prices than the direct fuel-price channel itself, consistent also with Daniel and Tosin (2020).

The heteroskedasticity, RESET rejection and parameter instability documented in Section 4.8 point to a plausible explanation for this divergence from parts of the literature: several studies reporting strong, significant fuel-price effects, such as Meludu, Komolafe and Chilaka (2024) and Muhammed, Hassan and Marafa (2024), examine specific commodities or localities over shorter, more homogeneous post-2023 windows, whereas the present study spans three decades of structural change, including earlier partial deregulation episodes, and estimates a single linear relationship across that entire period. Sani's (2014b) taxonomy of downstream oil market deregulation is instructive here: it frames the economic consequences of deregulation as conditional on a country's refining capacity and import dependence at a given point in time, both of which changed considerably for Nigeria between 1996 and 2025, so that a single, time-invariant linear coefficient may understate the reform's true, time-varying effect. This reinforces the case, developed further in Section 5, for future work using shorter post-reform windows, nonlinear ARDL specifications, or explicit structural-break modelling.

5. Conclusion and Recommendations

This study set out to examine the effect of petroleum subsidy withdrawal on agricultural sector output prices in Nigeria over 1996–2025 using an ARDL bounds-testing framework. The evidence obtained is directionally consistent with cost-push inflation theory, fuel price and exchange rate both carry positive coefficients, but is not strong enough to confirm a statistically significant long-run relationship: the bounds test is inconclusive, the error-correction term is insignificant, and neither the short-run nor the long-run fuel price coefficient is statistically significant. The one robust finding is a significant, positive short-run effect of exchange rate on agricultural output price. Diagnostic tests further indicate heteroskedasticity, functional-form misspecification and parameter instability concentrated around the 2023 reform, suggesting that a linear ARDL model estimated over a long, structurally heterogeneous period may not be the most appropriate tool for isolating this relationship.

These findings should not be read as proof that petroleum subsidy withdrawal has no effect on agricultural prices in Nigeria; rather, they indicate that this effect is not robustly identifiable with the present specification, sample and estimation window. Three recommendations follow. First, future research should re-estimate this relationship using data restricted to the post-2023 reform period once sufficient observations accumulate, and should consider a nonlinear or asymmetric ARDL specification to capture the possibility that agricultural prices respond more strongly to fuel price increases than decreases. Second, given the evidence of parameter instability, researchers should explicitly model the 2023 reform as a structural break, for example through an intervention dummy or a Bai–Perron break test, rather than assuming a single stable relationship across the full 1996–2025 period. Third, given the exchange rate series' incomplete official record and the resulting ambiguity in its unit root test, future work would benefit from a fully verified, non-interpolated exchange rate series, since this study's one statistically robust result, the short-run exchange rate effect, is also the variable whose underlying data required the most caution.

From a policy standpoint, the significant short-run exchange rate effect, combined with the theoretically plausible but not yet statistically confirmed fuel price channel, still supports a precautionary case for exchange rate stability as relevant to agricultural price management, and for pairing any future fuel price adjustment with targeted, short-run relief for agricultural value chains, pending more conclusive empirical confirmation of the fuel-price channel specifically. Continued investment in domestic refining capacity, which would reduce the naira's exposure to imported refined petroleum, remains a reasonable medium-term hedge against the exchange rate and fuel price risks jointly identified in this study, even though the present results counsel caution rather than firm conclusions ahead of more targeted future analysis.

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