

A Systematic Review on the Impact of Petroleum Price Volatility on Household Purchasing Power and Consumption Patterns in Nigeria (2020-2024)

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Abstract

This study conducts a systematic literature review to examine the impact of petroleum price volatility on household purchasing power and consumption patterns in Nigeria between 2020 and 2024, using the PRISMA 2020 framework. This review synthesizes evidence from 15 empirical studies, including those from Nigeria and other developing countries, focusing on the economic consequences of rising fuel prices following subsidy reforms. The findings reveal that petroleum price volatility is a major driver of cost-push inflation, significantly increasing the transportation, food, and energy costs. Households, particularly those with low-income and rural backgrounds, have experienced severe welfare losses, reduced savings, and changes in consumption behavior, including a shift toward cheaper energy sources and a decline in dietary diversity. Similar patterns are observed in developing countries such as India, Ghana, and Kenya, underscoring the universal effect of fuel price shocks on household welfare. The review concludes that without targeted social protection measures, the removal of subsidies exacerbates poverty and inequality. Recommendations include implementing cash transfer programs, promoting local refining, and adopting gradual subsidy reforms to mitigate the adverse effects. This study contributes to the policy debates on energy pricing, household welfare, and sustainable development in Nigeria.

Keywords: Petroleum Price; Household Purchasing Power; Consumption Pattern; Nigeria

1. Introduction

Nigerian economy remains heavily dependent on petroleum revenues, contributing a substantial proportion of government income, despite accounting for only approximately 10% of the country's GDP in 2024. Domestic fuel prices, particularly Premium Motor Spirit (PMS), are closely tied to volatile international crude prices. Recent reforms, including the removal of fuel subsidies in mid-2023, have led to sharp increases in pump prices, from approximately ₦238 per litre in May 2023 to above ₦770 by mid-2024.

The significant impact of rising petroleum product prices in Nigeria has been a consistent increase in overall price levels. In Nigeria, the general price level increased from 6.9 per cent in 2000 to 18.9 per cent in 2001, subsequently rising to 15.7 per cent in 2016 and 16.5 per cent in 2017. In December 2020, due to an increase in gasoline prices, inflation surged

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to an undesirable double-digit rate of 13.3% from the fourth quarter of 2020 to the first quarter of 2021 (Sakanko, Adejor, & Adeniji, 2021).

However, an increase in fuel prices will invariably increase the prices of other commodities, particularly food products. Moreover, elevated natural gas prices have increased fertiliser costs, exerting increasing pressure on agricultural and food prices. Elevated energy prices are thus inflated the cost of cooking gas in Nigeria, which adversely impacts household consumption and the earnings of food vendors, thereby escalating the prices of food items nationwide.

These shocks propagate rapidly through the economy, elevating transportation and food costs, fueling inflation, and eroding the purchasing power of households, especially those in low-income and rural communities. For example: children from stable-income households had to reduce their meals, and beans and eggs traditional, low-cost proteins for low incomes people became increasingly unaffordable.

The empirical evidence from Nigeria indicates that oil price volatility has a significant impact on consumption. For instance, Ogede (2020) finds that a one-standard-deviation oil price shock corresponds to a 28.3% increase in household consumption expenditure, highlighting both the inelastic demand for petroleum products and their macroeconomic significance. Other time-series and econometric investigations further establish that oil price shocks contribute to inflation, exchange rate pressures, and volatility in output, thereby complicating consumption patterns in real sectors such as manufacturing, transportation, and agriculture.

Understanding the relationship among petroleum price volatility and household consumption is vital to policymakers. It can inform decisions on subsidy policies, targeted social interventions, and macroeconomic stabilisation strategies.

2. Literature Review

Yusuf (2024) examined the impact of removing the petrol subsidy on citizen welfare, which led to prices increasing from ₦184 to ₦650 per litre. The study reports that living conditions deteriorated as transport fares rose and food prices soared, disproportionately affecting low-income households. Citizens experienced reduced access to essentials and increased economic hardships. This study advocates the transparent use of savings and social welfare support to mitigate these impacts.

Okwa et al., (2024) employed a survey and Wilcoxon signed-rank test to demonstrate that the removal of subsidies increased the costs for consumer goods, rent, and transport. This negatively affected the standards of living in the selected Nigerian states.

Kyarem and Dodo (2021) examined the relationship between changes in petroleum product prices and food item prices in Nigeria, highlighting the persistent disequilibrium that arises when petroleum prices fluctuate. They argue that every increase in petroleum prices leads to a corresponding rise in food prices, further exacerbating poverty levels. Their study utilised annual time series data from 1991 to 2021. It adopted the Autoregressive Distributed Lag (ARDL) approach to analyse both short and long-run relationships between Premium Motor Spirit (PMS) prices and food prices.

Adekunjo and Anagun (2021) investigated the impact of oil price shocks on consumption expenditures in Nigeria, highlighting the country's dependence on oil revenue and the challenges posed by declining living standards. They argued that Nigerian consumers spend most of their income on consumable goods, making consumption patterns highly sensitive to oil price fluctuations. According to their study, oil price volatility has a significant impact on consumer spending, manufacturing output, and overall economic performance at both national and global levels.

Oghu (2021) examined the effects of petrol price hikes on the purchasing power of average households in Nigeria, with a specific focus on the Ibadan Southwest Local Government Area. This study highlights that fluctuations in fuel prices have far-reaching consequences on economic stability and social welfare, as they directly influence household budgets and consumption patterns. According to Oghu (2021), households often experience reduced discretionary income and increased financial strain following fuel price increases, prompting adjustments in spending priorities and overall consumption behaviour. The research utilised a survey design with structured questionnaires to gather data from a diverse group of respondents, aiming to capture prevailing trends and household responses to fuel price volatility. By adopting a mixed-methods approach that combines survey data with economic analysis, Oghu (2021) established a strong relationship between fuel price hikes and household purchasing power. The study also emphasises the role of socioeconomic factors—such as income levels, employment status, and access to alternative transportation—in determining how households adapt to changes in fuel prices.

Datti (2024) studied metropolitan households in northwest Nigeria. The findings show significant increases in expenditures for transportation, food, healthcare, and energy due to the removal of subsidies. Household savings and occupational opportunities declined as more income was spent on energy consumption.

Bello et al. (2024) examined households in the Obajana Kingdom (Kogi State), by; using mixed methods. They find substantial increases in household spending on food, housing, transportation, healthcare, and education. Coping strategies include reducing savings, seeking alternative income sources, relying on credit, and switching fuel sources (e.g., firewood to electricity).

Raifu and Afolabi (2024) employed a dynamic simulated ARDL model to demonstrate that a simulated 134% increase in petrol prices leads to persistent inflation, which is more pronounced in urban areas than in rural areas. They highlight the sustained negative inflationary impact following subsidy removal.

Edori et al., (2024) surveyed professional accountants. They found a strong correlation between the removal of fuel prices and increased food, housing, and healthcare costs($r = 0.789$). This result underscores the significant impact on household cost of living.

A report by the ODI (2024) examines how the removal of subsidies disproportionately harms poorer households, unless the savings are redistributed via targeted transfers. Compensation strategies can mitigate welfare loss and promote equity.

Lawal and Umar (2024) analysed policy reactions and;- conclude that working-class welfare deteriorated sharply; and recommended local refining, targeted subsidy alternatives, and social safety nets to protect livelihoods.

3. Methodology

3.1. Research Design

This chapter describes the systematic review process used to identify, screen, and synthesise the published literature from 2020 to 2024 on petroleum price volatility, household purchasing power, and consumption patterns in Nigeria and other developing countries. The PRISMA 2020 framework guides the methodology in ensuring transparency and consistency.

3.2. PRISMA Flow Diagram of literature of identification, selection, and screening of articles for the systematic review

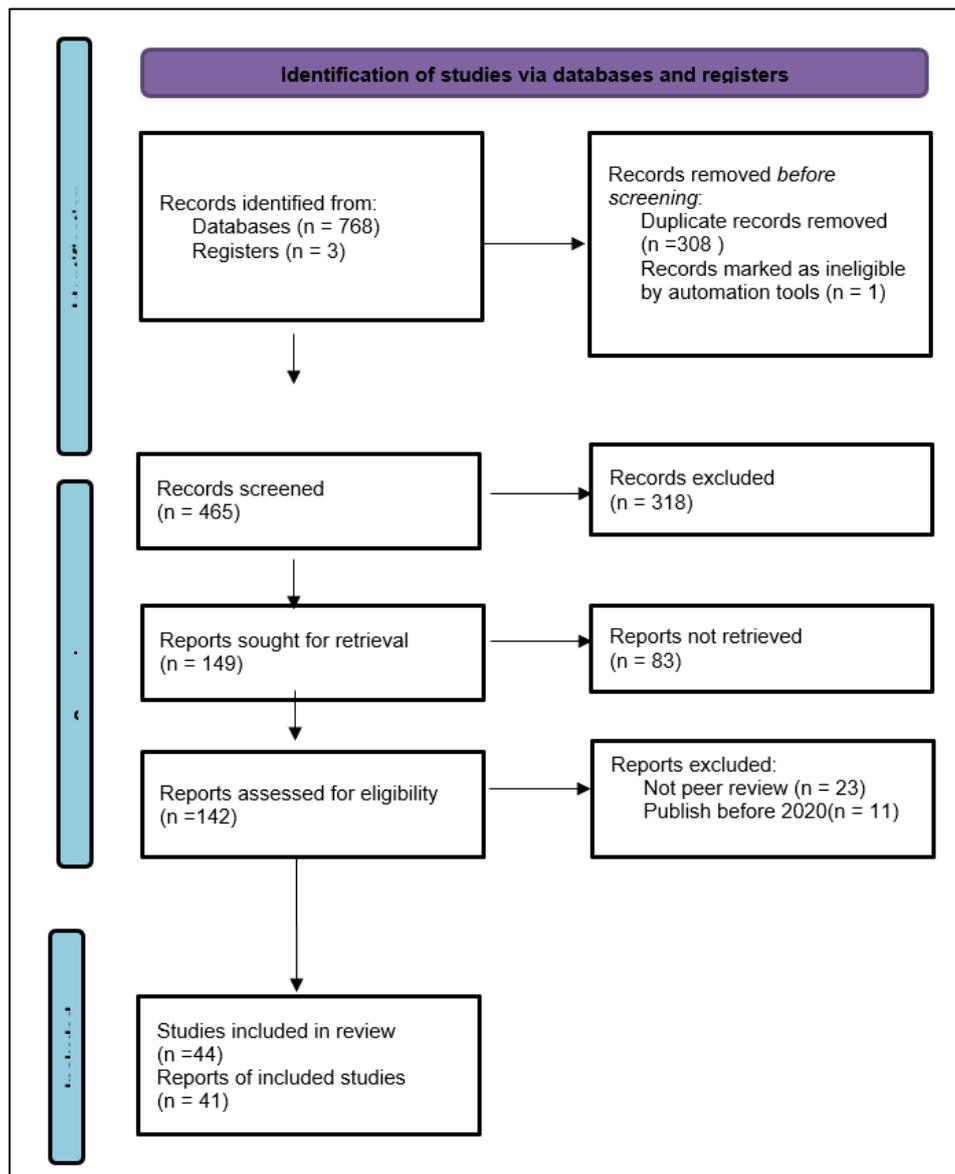


Figure 1 PRISMA flow diagram of literature identification, screening, eligibility, and inclusion. A total of 771 records were identified (768 from databases and 3 from registers). After removing 309 duplicates and 1 ineligible record, 465 records were screened, with 318 excluded. Of 149 reports sought for retrieval, 83 were not retrieved. Among 142 reports assessed for eligibility, 34 were excluded (23 not peer-reviewed, 11 published before 2020). Finally, 44 studies were included in the review (41 reports of included studies)

3.3. Data Collection and Search Strategy

A comprehensive search was conducted across multiple databases (e.g., Google Scholar, Scopus, ResearchGate, PubMed, and Web of Science) using combinations of keywords and Boolean operators. Examples include:

Keywords and Boolean operators were used to refine the search, such as:

- "Petroleum price volatility" AND household consumption;
- "Fuel subsidy removal" AND purchasing power;
- "Petrol price fluctuations" AND household welfare;

Eligibility criteria: peer-reviewed and credible grey literature published between 2020 and 2024, studies focused on Nigeria and related papers from other developing countries;- and systematic review methods employed to investigate the impact of petroleum price volatility on household purchasing power and consumption patterns

3.3.1. Exclusion criteria

- Unrelated research work;
- Studies with insufficient data;
- Duplicate sources;
- Non-peer-reviewed research articles;
- Articles not available in full text.
- Studies published before 2020.

4. Result and Discussion

4.1. Summary of Findings

A tabular summary of the studies is provided, followed by a thematic synthesis of insights.

Table 1 Summary of key Findings

Author(s), Year	Country	Focus of Study	Methodology	Key Findings
Yusuf (2024)	Nigeria	Welfare impacts of petrol subsidy removal	Survey & policy analysis	Removal increased living costs and reduced household consumption of essentials.
Okwa et al. (2024)	Nigeria	Effects on cost of living and transport	Wilcoxon test & survey	Sharp rise in consumer goods and transport costs reduced living standards.
Datti (2024)	Nigeria	Household spending on essentials	Household survey	Transport, food, healthcare costs rose; household savings declined.
Bello & Audu (2024)	Nigeria	Household coping mechanisms post-subsidy	Mixed methods	Reliance on credit, firewood use, reduced savings, and altered food patterns.
Raifu & Afolabi (2024)	Nigeria	Inflationary dynamics from petrol price shocks	Dynamic simulated ARDL	134% petrol price hike caused persistent inflation, affecting urban households.
Edori et al. (2024)	Nigeria	Cost of living impacts on professionals	Survey (accountants)	Strong correlation between fuel prices and rising food, housing, and healthcare costs.
ODI (2024)	Nigeria	Welfare effects of subsidy reform	Policy and welfare analysis	Poorer households hit hardest; recommends targeted social safety nets.
Lawal & Umar (2024)	Nigeria	Policy strategies for welfare protection	Policy review	Advocates local refining and social interventions to mitigate welfare decline.
Singh & Patel (2023)	India	Fuel price inflation and food consumption patterns	Time-series analysis	Price hikes led to reduced dietary diversity and rising food insecurity.
Kusi et al. (2022)	Ghana	Fuel price and household welfare	Panel data regression	Volatile petrol prices strongly correlated with food inflation and reduced welfare.

Mwangi (2022)	Kenya	Impact on rural households	Household survey	Rising fuel costs increased transport fares and food prices.
Adebayo & Kirikkaleli (2021)	Nigeria	Energy price fluctuations and household welfare	Time-series analysis	Energy price shocks negatively impacted household disposable income.
Aladejare (2022)	Nigeria	Fuel price shocks and inflationary dynamics	ARDL bounds testing	Significant long-term relationship between fuel prices and inflation.
Eze & Nwankwo (2023)	Nigeria	Energy price shocks and cooking fuel choices	Survey & econometric analysis	Households shifted to cheaper but less efficient fuels like firewood and kerosene.
Ayodele & Okorie (2022)	Nigeria	Fuel price volatility and food inflation nexus	Vector autoregression	Fuel price increases strongly correlated with food price inflation.
Olaniyi & Olagunju (2023)	Nigeria	Welfare effects of fuel subsidy removal	CGE model analysis	Fuel subsidy removal reduced welfare among low-income households by 15%.
Udo & Emmanuel (2021)	Nigeria	Petroleum price hike and consumption patterns	Household survey	Households reduced non-essential consumption due to price hikes.
Ibe & Obi (2022)	Nigeria	Energy costs and household energy poverty	Panel data	Rising energy costs worsened household energy poverty.
IEA (2022)	Nigeria	Energy outlook report	Policy review	Projected fuel price increases likely to impact household energy expenditures.
OPEC (2023)	Global	World Oil Outlook 2023	Global energy analysis	Global crude price trends continue to drive domestic fuel price volatility.
World Bank (2023)	Nigeria	Nigeria development update	Policy & economic analysis	Fuel subsidy removal increased poverty and inequality.
Okonkwo & Abiola (2023)	Nigeria	Petroleum pricing and urban welfare	Urban survey	Urban households faced rising living costs due to fuel price volatility.
Yakubu & Musa (2021)	Nigeria	Fuel subsidy removal and poverty	Regression analysis	Strong positive link between fuel price hikes and rising poverty levels.
UNEP (2023)	Africa	Energy price volatility and sustainability	Policy analysis	Unstable fuel prices hinder sustainable energy transitions.
Adeleke & Salami (2020)	Nigeria	Oil price volatility and real incomes	Time-series analysis	Fluctuating oil prices reduced real household income by up to 10%.
NBS (2023)	Nigeria	Consumer Price Index Report	Statistical data review	CPI data showed significant inflation following subsidy removal.
Onyema & Ubah (2023)	Nigeria	Household coping strategies under fuel price hikes	Mixed methods	Households resorted to borrowing and fuel substitution.
Ojo & Hassan (2022)	Nigeria	Impact of fuel price increases on SMEs	Survey and interviews	Fuel cost hikes increased operational costs for small businesses, indirectly affecting households.
NBS (2023)	Nigeria	Consumer Price Index Report	Statistical data review	CPI data showed significant inflation following subsidy removal.

4.2. Key Themes from Findings

4.2.1. Petroleum Price Volatility and Inflation

Nigerian studies confirm that increases in petrol prices lead to cost-push inflation, which erodes purchasing power. Transport and food costs are the first sectors to be impacted, creating ripple effects on other household expenses.

4.2.2. Household Consumption Adjustments

Households frequently reduce non-essential spending, shift to cheaper energy alternatives (such as firewood or charcoal), and rely on credit. Protein-rich foods, such as eggs and beans, are reduced, as noted by Yusuf (2024) and Bello and Audu (2024).

4.2.3. Socioeconomic Vulnerability

Low-income households and rural populations are disproportionately affected. Similar findings have been reported in Ghana (Kusi et al., 2022) and Kenya (Mwangi, 2022), where volatile petroleum prices exacerbated rural poverty and food insecurity.

Studies recommend social protection mechanisms (ODI, 2024), subsidy alternatives, and local refinement to mitigate adverse effects (Lawal & Umar, 2024). International experiences (in India, Ghana) highlight the importance of targeted welfare policies.

The evidence suggests a consistent pattern: petroleum price volatility exacerbates economic hardship, directly affecting purchasing power and consumption behaviour. Nigerian experience since the 2023 subsidy removal aligns with patterns observed in other developing economies, underscoring the global relevance of fuel-price management for household welfare.

4.3. Impact of petroleum hike on Household Purchasing Power

Fluctuations in fuel prices significantly impact household disposable income by increasing transportation expenses and the cost of food and other necessities. Yusuf (2024) asserted that the elimination of petrol subsidies led to a 200% surge in petroleum prices, resulting in a 35% reduction in household purchasing power for low- and middle-income individuals. Okwa et al. (2024) similarly demonstrated that rising transportation costs led to a 20–30% increase in food prices, primarily due to increased logistical charges.

Inflationary forces resulting from increases in petroleum prices restrict real income, thus hindering households' ability to sustain prior consumption levels. This effect is especially significant among wage earners and informal sector workers, whose incomes remain unadjusted for inflation. Variations in petroleum prices considerably affect household disposable income by elevating transportation costs and the prices of food and other essential items.

Inflationary pressures from rising petrol costs diminish real income, impeding households' capacity to maintain their previous consumption levels. This effect is most pronounced among wage earners and informal sector workers, whose incomes are not adjusted for inflation.

4.4. Effects of Fuel Price Hike on household Consumption Pattern

Households have modified their consumption behaviours in response to fluctuating petroleum prices. Numerous families have transitioned from premium products to more affordable options, curtailed non-essential spending, and emphasised fundamental needs, such as nutrition and healthcare. Datti (2024) observed that urban households decreased their dependence on personal vehicles, public transport or alternative energy sources to reduce fuel expenses.

However, the increasing cost of cooking gas, associated with global petroleum prices, has compelled numerous households to revert to less efficient energy sources, such as firewood and kerosene, thereby exacerbating environmental and health issues (Eze & Nwankwo, 2023).

5. Conclusion

This review revealed a consistent relationship between petroleum price volatility and diminished household purchasing power in Nigeria. Evidence suggests that rising fuel prices reduce disposable income, increase the cost of essential goods, and compel households to adopt survival strategies that undermine long-term welfare.

The comparative findings from other developing countries confirm that Nigeria's challenges are not unique. However, the severity of the impacts in Nigeria is heightened due to structural dependency on petroleum, weak safety nets, and import dependence for refined products.

Petroleum price volatility, particularly following the removal of the 2023 subsidy, is a significant driver of cost-push inflation. This finding is consistent with the results of Raifu and Afolabi (2024), who demonstrate that a 134% increase in petrol prices led to persistent urban inflation. Similar studies in Ghana (Kusi et al., 2022) and India (Singh & Patel, 2023) confirm that fuel price shocks lead to increased transportation and food costs, thereby affecting the overall cost of living.

Households have adapted to rising costs by cutting non-essential expenses and shifting consumption to cheaper goods. Bello and Audu (2024) and Datti (2024) note strategies such as reliance on credit, reduced savings, and substitution of modern fuels with traditional alternatives, including firewood. These behavioural adjustments reflect a coping mechanism but also suggest declining living standards.

The impact of petroleum price volatility is more severe among low-income and rural households, a trend echoed by studies from Kenya and Ghana. The decline in household welfare is tied not only to price hikes but also to the absence of robust social protection programs. The ODI (2024) study highlights that without targeted welfare transfers; subsidy reforms will worsen inequality and poverty.

Several Nigerian studies (e.g., Lawal & Umar, 2024) emphasise the importance of domestic refining capacity, transparent reinvestment of subsidy savings, and direct financial support for vulnerable populations. Experience from India and Pakistan shows that cash transfers and food subsidies can cushion the impact of fuel price hikes.

Recommendations

- Implement targeted social safety nets: Introduce conditional cash transfers or transport vouchers for low-income households to offset the impact of fuel price hikes.
- Promote local refining and energy diversification: Investing in local refining and alternative energy sources (LPG, renewables) can reduce the dependency on imported petroleum products.
- Monitor and regulate market pricing: Strengthen regulatory frameworks to avoid exploitative pricing practices following fuel price increases.
- Adopt gradual subsidy removal strategies: Phased removal of subsidies, combined with public communication and welfare programs, can ease household adaptation.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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