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## Financial Implications of Fuel Subsidy Removal on Economic Indicators: Global Insights from Nigeria

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# Financial Implications of Fuel Subsidy Removal on Economic Indicators: Global Insights from Nigeria

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## Abstract

Nigeria's economic stability is intricately connected to its transportation sector and fuel pricing. This study aims to investigate the financial implications of fuel subsidy removal on fuel prices, transportation costs, and broader economic indicators by examining Nigeria's public and private sectors. The study employs secondary data from the National Bureau of Statistics of Nigeria and financial reports from selected firms. Statistical methods include panel regression models (random effects), descriptive statistics, and diagnostic tests such as the Hausman test. The study reveals a substantial negative impact of fuel subsidy removal on petrol prices and transportation costs. Post-subsidy removal, fuel prices and transportation costs significantly increased. Additionally, removing subsidies has led to a noticeable rise in inflation, highlighting broader economic consequences. The findings suggest that removing fuel subsidies has adverse financial effects on fuel prices, transportation costs, and overall economic metrics in Nigeria. The study recommends that policymakers implement targeted social safety nets, including cash transfer programs and subsidies for essential goods, and consider a gradual approach to subsidy reform to mitigate economic shocks and foster sustainable growth. Economically, the removal of fuel subsidies has led to increased fuel prices and transportation costs, contributing to inflation and economic instability. Socially, it disproportionately affects low-income households, exacerbating income inequality and social unrest. Policymakers need to consider the trade-offs of subsidy removal and implement measures to protect vulnerable populations, monitor inflation, and adjust monetary policy for sustainable economic growth.

**Keywords:** Economic indicators, Fuel Subsidy Removal, Financial Implications, Global Insights, Nigeria

## 1. Introduction

The removal of fuel subsidies is a controversial economic policy with significant financial implications for a nation's economic and social well-being. Subsidies, which involve government intervention to lower consumer prices below market rates, represent expenditures that do not directly contribute to asset creation or reduction of government liabilities. In Nigeria, fuel subsidies have historically allowed consumers to pay less for gasoline than market prices. However, the abrupt removal of these subsidies has sparked widespread debate and concern about its potential impact on Nigeria's economy and socio-political landscape.

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Nigeria has historically relied heavily on subsidized fuel, a staple for households and businesses. This dependence stems from the underdevelopment of alternative energy sources, such as electricity, which is often unreliable. As a result, many Nigerians rely on kerosene or gasoline for their daily needs, from cooking to powering businesses. The recent announcement of fuel subsidy removal has sparked concerns about its potential economic consequences (Timilsina & Curiel, 2023). While the government aims to redirect resources towards critical infrastructure, the economy's short- and long-term implications may be more complex than anticipated. This study examines the global empirical literature on similar policies to provide insights into the potential economic effects of fuel subsidy removal in Nigeria.

Despite Nigeria's substantial crude oil production, it faces numerous challenges, including adverse economic conditions, trade barriers, inadequate infrastructure, currency valuation uncertainties, investment constraints, and limited foreign exchange capacity. This overreliance on oil and structural deficiencies has led to civil unrest, corruption, environmental degradation, and economic exploitation.

The removal of fuel subsidies became a key focus of Nigeria's fiscal policy for 2023, as highlighted in the budget proposal. President Bola Tinubu's decision to eliminate the popular petrol subsidy was intended to redirect savings towards crucial sectors such as education, power supply, transportation infrastructure, and healthcare. However, this move raised concerns about potential fuel shortages, increased living costs, and higher business expenses. While subsidies can positively impact goods supply by reducing production costs and expanding product variety, their removal has immediate consequences. To manage the aftermath of subsidy withdrawal, coping strategies have been proposed, including reducing reliance on petrol-powered generators, embracing public transportation, efficient trip planning, budgeting adjustments, and adopting energy-saving practices.

The transportation sector, vital to Nigeria's economic health, facilitates the movement of goods and people across the country. Disruptions in this sector can significantly impact the population's well-being and economic performance. The sector's performance is assessed based on factors such as delivery timeliness, safety, cost management, revenue generation, and customer satisfaction. The removal of fuel subsidies has had noticeable effects on Nigeria's transportation sector, which includes roads, railways, pipelines, ports, inland waterways, and aviation.

While existing studies, among others, have predominantly focused on the public sector, this research aims to investigate how the removal of fuel subsidies affects fuel prices, transport costs, and the economy in both the public and private sectors.

This research aims to bridge gaps identified in existing studies like those conducted by Nwachukwu and Chike (2011), Tober (2011), Lin and Li (2012); Bazilian and Onyeji (2012); Al-Shehabi (2013); Ouyang and Huang (2015); Anyanwu (2016); Akinwale and Koya (2017); Alabi and Osabuohien (2017); Adegbe and Loto (2019); Inegbedion et al. (2023), Timilsina and Curiel (2023); Antimiani, Costantini and Paglialunga (2023) which predominantly focus on the public sector. This is crucial as it draws attention to these measures' enduring ramifications and sustainability and underscores the need for additional research to inform policymaking. Additionally, there is limited research into the financial implications of fuel subsidy removal on fuel prices, transport fares, and the economy, explicitly considering Nigeria's private and public sectors. By examining the

public and private sectors, this study provides a comprehensive analysis of the financial implications of fuel subsidy removal on economic indicators, such as fuel prices, transportation costs, and the broader economy, with global insights from Nigeria, offering insights for more informed policymaking. Specifically, the research examines the financial impact of fuel subsidy removal on fuel prices, assesses the financial implications of subsidy removal on transportation costs and transportation companies in Nigeria, and determines the broader economic ramifications of subsidy withdrawal on Nigeria's economy. This research is essential to highlight the ongoing adverse financial effects of fuel subsidy removal on fuel price increases, transport fare hikes, the well-being of the populace and the overall economic condition of the country, contributing to more informed global policymaking in the future.

## **2. Literature Review**

### *2.1 Theoretical Framework*

This study draws on several theoretical frameworks, including Social Impact Theory, Policy and Governance Theory, Economic Theory, Environmental Impact Theory, and Market Competition Theory, to explore the financial implication of fuel subsidy removal on Nigeria's transportation firms and economic indicators. Social Impact Theory introduced by Okoli and Ukwueze (2019), elucidates that the elimination of fuel subsidies may amplify transportation costs, thereby jeopardizing the accessibility and affordability of transportation services for socioeconomically disadvantaged groups (Inegbedion, Inegbedion & Abiola-Asaleye, 2023). Emphasizing the social implications of policy alterations, this theory underscores the potential exacerbation of transportation challenges among vulnerable communities within Nigeria (Inegbedion et al., 2023).

Additionally, Policy and Governance Theory, pioneered by Olowookere (2018), posits that governmental strategies concerning fuel subsidy removal, regulatory frameworks, and transparency in resource allocation will profoundly influence the conduct and performance of transportation enterprises (Inegbedion et al., 2023). Complementing this perspective, Economic Theory, articulated by Akinwale and Koya (2017), contends that the cessation of fuel subsidies is poised to escalate operational expenditures for transportation firms, culminating in diminished profitability (Inegbedion et al., 2023). This theoretical lens underscores the intricate relationship between transportation entities' financial viability and fuel subsidies' presence (Inegbedion et al., 2023).

Moreover, the Environmental Impact Theory, postulated by Eze and Aremu (2016), suggests that discontinuing fuel subsidies may incentivize transportation companies to invest in eco-friendly and fuel-efficient technologies (Inegbedion et al., 2023). Implied within this theory is the notion that heightened fuel costs could drive the adoption of cleaner and sustainable practices within the industry. Furthermore, Market Competition Theory, espoused by Onugu and Osabuohien (2014), asserts that removing fuel subsidies might intensify competition within the transportation sector, compelling firms to streamline costs and seek competitive advantages (Inegbedion et al., 2023).

Social impact theory highlights how removing fuel subsidies may increase transportation costs, impact socioeconomically disadvantaged groups and exacerbate transportation challenges in every economy. Policy and governance theory suggests that government strategies and regulatory frameworks regarding subsidy removal will significantly influence transportation enterprises' performance. The economic theory predicts that

ending fuel subsidies will raise operational costs for transportation firms, reducing profitability. At the same time, Environmental Impact Theory posits that higher fuel costs may incentivize investment in eco-friendly technologies within the transportation sector. Finally, market competition theory suggests that subsidy removal could increase competition, prompting firms to optimize costs and seek competitive advantages. These theories collectively provide a nuanced understanding of the impacts of subsidy removal, covering economic, environmental, social, and competitive dimensions.

## *2.2 Reimagining Fuel Subsidy*

Within the petroleum domain, fuel subsidy intricately involves bridging the gap between market fuel prices and what consumers pay at the pump (Adegbie & Loto, 2019). Its essence lies in crafting a pricing equilibrium to render fuel accessible by cushioning consumers from bearing the full brunt of market dynamics (Anyanwu, 2016). In Nigeria, the Petroleum Product Pricing Regulatory Agency (PPPRA, 2013) delineates fuel subsidy as compensating importers based on the disparity between the landed cost and ex-depot price (Eze & Aremu, 2016). The Nigerian National Petroleum Company Limited (NNPCL) reported a significant monthly expenditure on subsidies, highlighting the economic strain of their removal (Inegbedion et al., 2023). Policymaking should prioritize a balanced approach, considering both economic and social impacts.

Historically, this governmental intervention aimed to alleviate fuel costs by subsidizing oil companies, effectively making the product more affordable for consumers (Federal Republic of Nigeria (FRN), 2023). Subsidies typically fall into two categories: production subsidies, which curtail production costs, and consumption subsidies, which defray the cost for end-users (Okoli & Ukwueze, 2019). In Nigeria, the cessation of fuel subsidies in 2023 marked a seismic policy shift, intending to recalibrate gasoline pricing dynamics while ensuring equitable compensation for producers, tackling poverty, and fortifying energy security (Inegbedion et al., 2023).

## *2.3 Financial Implication of Fuel Subsidies Removal*

Governments use subsidies to support various sectors, including the petroleum industry, by reducing the gap between market and consumer prices. In Nigeria, the Petroleum Product Pricing Regulatory Agency (PPPRA, 2013) defines fuel subsidies as compensation for importers based on price differences (Eze & Aremu, 2016). The 2023 removal of these subsidies in Nigeria aimed to recalibrate fuel pricing while addressing poverty and energy security (Antimiani et al., 2023).

### *2.3.1 Positive Financial Implication of Fuel Subsidies Removal*

Removing fuel subsidies in Nigeria presents a significant financial opportunity for economic growth (Antimiani et al., 2023). The government can address long-standing infrastructure deficits and stimulate economic activity by redirecting the saved funds towards critical public infrastructure development. Additionally, these funds can be allocated to other sectors, such as agriculture, healthcare, tourism, and education, which have historically been underfunded. By investing in these areas, Nigeria can improve its overall development and enhance the well-being of its citizens (Al-Shehabi, 2013). Also, removing fuel subsidies can significantly reduce the Nigerian government's need to borrow money. Previously, fuel subsidy payments heavily burdened government finances, leading to increased borrowing, particularly during economic downturns

(Ouyang & Huang, 2015). With the subsidy gone, the government can use the saved funds to cover its expenses without relying as heavily on loans from the Central Bank.

Another potential benefit is increased employment. A deregulated downstream sector would allow more companies to enter the fuel import market, creating new jobs. Additionally, revitalizing domestic refineries would lead to further job creation, with projects like the Dangote refinery expected to generate tens of thousands of jobs directly and indirectly (Antimiani et al., 2023). Fuel subsidy removal could also strengthen the Nigerian Naira. The government can conserve foreign exchange reserves by reducing reliance on imported fuel and potentially exporting domestically refined products. This increased supply of foreign exchange would stabilize the Naira's exchange rate against the US dollar (Ouyang & Huang, 2015). For example, the Dangote refinery's large capacity could eliminate the need for fuel imports, saving billions of dollars and boosting the Naira's value (Al-Shehabi, 2013). Finally, a well-implemented fuel subsidy removal plan could decrease Nigeria's dependence on imported fuel. Domestic refineries, particularly large projects like Dangote, can meet domestic demand and even generate a surplus for export (Antimiani et al., 2023). This would significantly reduce reliance on foreign fuel sources and strengthen Nigeria's energy security.

### *2.3.2 Negative Financial Implication of Fuel Subsidies Removal*

The removal of fuel subsidies may pose adverse financial and economic effects on the economy, including increased poverty, increased cost of living, reduced access to education and healthcare, and economic instability (Antimiani, Costantini & Paglialunga, 2023). Removing fuel subsidies leads to an immediate increase in fuel prices as the government withdraws its offsetting role (Okon & Ubom, 2021). Studies by Inegbedion, Inegbedion, and Abiola-Asaleye (2023) reveal that subsidy removal results in inflationary effects, increased transport costs, and higher prices for goods. Adegbe and Loto (2019) also report that subsidy elimination has significantly affected low-income households, emphasizing the need for targeted social safety nets. Their removal invariably triggers an immediate uptick in fuel prices as the government relinquishes its offsetting role (Okon & Ubom, 2021). In a meticulous study by Inegbedion, Inegbedion, and Abiola-Asaleye (2023), the reverberations of petroleum subsidy cessation and subsequent fuel price hikes on Nigeria's economic tapestry were dissected. Employing an input-output model, the study showcased how slashing petroleum subsidies led to an inflationary ripple effect, spiking transport costs and permeating various goods' pricing structures due to intertwined economic linkages. Given its profound economic ramifications, this underscores policymakers' need to tread cautiously when contemplating subsidy withdrawal.

As Inegbedion et al. (2023) reported, the abolition of fuel subsidies precipitated a marked escalation in fuel prices, echoing the findings of Adegbe and Loto (2019), who employed a blend of qualitative and quantitative methodologies. While alleviating the fiscal burden on the government, subsidy elimination concurrently heralded a substantial surge in fuel prices, disproportionately impacting low-income households. Advocating for targeted social safety nets to mitigate adverse repercussions on vulnerable demographics, these studies accentuate the need for vigilant policy monitoring and adaptive measures. President Bola Tinubu's decision to abolish petrol subsidies in 2023, as chronicled by Inegbedion et al. (2023), has compounded the populace's woes, exacerbating economic hardships and heralding a cascade of fuel price escalations and elevated living costs.

Transportation expenses ballooned by over 100 per cent, correlating with soaring food prices and augmented transportation overheads (Inegbedion et al., 2023). The surge in fuel costs, ranging from N537 to N700, catalyzed a nationwide doubling of transportation fares. For instance, fares between Lagos and Abuja with a prominent transport company surged from N16,000-N20,000 to N32,500-N38,000 post-subsidy removal. Analogous fare spikes reverberated nationwide while air travel costs soared beyond N150,000, precipitating a decline in air travel uptake among Nigerians.

The dissolution of petrol subsidies has cast a pall of poverty, impeding children's access to quality education and affordable healthcare, convulsing demand-supply dynamics, and inducing capricious undulations in economic activity. Despite agricultural sector endeavours, Nigeria grapples with food sufficiency, resorting to imports (Anyanwu, 2016). Alabi and Osabuohien's holistic analysis, amalgamating political economy, policy documents, and stakeholder insights, elucidated how political considerations trumped economic prudence in the subsidy elimination decision. Advocating for a more inclusive policymaking ethos predicated on rigorous economic analysis rather than political exigency, their findings underscore the need for a recalibrated approach.

Simultaneously, the Nigerian National Petroleum Company Limited's (NNPCL) disclosures spotlight an astronomical monthly outlay of over N400 billion on petrol subsidies (Inegbedion et al., 2023). Terminating these subsidies risks inflationary tremors, compromising economic well-being, stunting growth, denting household incomes, and eroding corporate competitiveness.

#### *2.4 Research Hypotheses*

Based on the literature, the following hypotheses guide this study:

- a. There is no financial impact of fuel subsidy removal on fuel prices.
- b. Fuel subsidy removal has no financial implications on transportation costs and transportation companies in Nigeria.
- c. There are no broader economic ramifications of subsidy withdrawal on Nigeria's economy.

### **3. Methods**

The study adopts a quantitative approach and expo-facto research design to assess the financial implications of fuel subsidy removal on fuel prices, transportation costs, transportation companies, and economic indicators, focusing on Nigeria's economy. The design was considered because the study leveraged already existing data. The study obtained secondary data from the National Bureau of Statistics of Nigeria and the financial reports of selected transportation firms. From the study population of ten (10) listed road transport companies on the Nigerian Exchange Group (NXG) plc, a sample of eight was purposively selected based on the availability of pertinent data.

The study employs panel regression models (Pooled OLS, Random Effects, and Fixed Effects Models) to evaluate the relationship between subsidy removal and economic variables using Nigerian economic indicators. Diagnostic tests, including the Hausman, F-restricted, and ADF unit root tests, ensure model stability and address potential serial correlation. Descriptive statistics such as mean, standard deviation, median, minimum, and maximum values are also utilized.

The study's model was based on a designed econometric framework to capture the study's earlier stated objective.

### 3.1.1 Model Specification

This research is based on an econometric model specified below:

$$FSR_t = \alpha_0 + \alpha_1 PFSPPs_t + \alpha_2 TCAFSR_t + \alpha_3 IRAFSR_t + e_t \text{ --- (3.1.1)}$$

Where:

$FSR_t$  = Fuel subsidy removal in Nigeria in year t;

$PFSPPs_t$  = Post fuel subsidy removal petrol prices in Nigeria in year t;

$TCAFSR_t$  = Transport cost after fuel subsidy removal in Nigeria in year t;

$IRAFSR_t$  = Inflation rate after fuel subsidy removal in Nigeria in year t.

The above model was specified based on the research's independent, dependent and control variables. These methodologies, previously used by Nwachukwu and Chike (2011), Tober (2011), Lin and Li (2012), Bazilian and Onyeji (2012); Al-Shehabi (2013); Ouyang and Huang (2015); Akinwale and Koya (2017), Alabi and Osabuohien (2017), Adegbe and Loto (2019), and Inegbedion et al. (2023), facilitate a comprehensive investigation of the research objectives. Detailed information on these variables is provided in Table 1.

**Table 1**

*Variable Measurements and Identification*

Type of Variable	Variable Proxy	Measurement	Sources
Independent variable	Fuel subsidy removed in 2023-2024 (AFSR)	Log of the amount of fuel subsidy	Inegbedion et al., (2023). NBS (Nigeria), (2024)
Dependent variables:	Post Fuel Subsidy Removal Petrol Prices (PFSPPs), 2023-2024	Increase in Price per litre of petrol	Inegbedion et al., (2023). NBS (Nigeria), (2024)
	Transport cost After Fuel Subsidy Removal, 2023-2024 (TCAFSR)	Average percentage change in road transport costs nationwide	Inegbedion et al., (2023). NBS (Nigeria), (2024)
Control variable	Inflation Rate After Fuel Subsidy Removal (IRAFSR), 2023-2024	Rate of inflation	Inegbedion et al., (2023). NBS (Nigeria), (2024)

Source: Data compilation (2024)



## 4. Results and Discussion

This section analyzed the outcomes by examining descriptive statistics, panel models, and comprehensive diagnostic and stability tests, accompanied by detailed explanations, to elucidate the findings.

**Table 2**

*Descriptive Analysis Results*

Variables	Mean	Median	Max.	Min.	Std. Dev	JB	Probability
FSR	0.8282	0.630	1.6400	0.040	0.46419	15.32151	0.0000
PFSPPs	3.2686	360.0	1.5010	3.750	283.970	11.60730	0.0000
TCAFSR	3.2282	0.530	1.6400	0.040	1.46419	14.59151	0.0000
IRAFSR	0.3282	0.720	2.0400	0.640	0.00419	12.03151	0.0000

*Source:* National Bureau of Statistics of Nigeria (2023); Financial Reports (2023) of Selected Listed Transportation Firms on Nigerian Exchange Group plc

Table 2 presents comprehensive statistics detailing the impact of fuel subsidy removal in Nigeria during 2023. The average value of fuel subsidy removal (FSR) stands at 0.8282, indicating an 83% reduction in subsidies, significantly affecting the Nigerian economy. The Median FSR is 0.630, ranging from a minimum of 0.040 to a maximum of 1.6400, with a Standard Deviation (SD) of 0.46419, depicting a distribution skewed below the mean. After subsidy removal, the mean percentage increase in petrol prices (PFSPPs) is 3.2686, reflecting a substantial 326% surge. PFSPPs range from 1.5010 to 3.750, with a Standard Deviation of 283.970, indicating a typical spread. The Median PFSPPs value is 360.0. In examining the descriptive statistics, it was noted that the standard deviation for PFSPPs is significantly higher than other dependent variables. This reflects the volatility in petrol prices after the subsidy removal, as prices experienced a rapid increase, with some regions showing disproportionately higher costs due to supply chain disruptions and variations in regional market dynamics.

Furthermore, the average percentage increase in transport costs post-subsidy removal (TCAFSR) is 3.2282, signalling a 322% escalation in transport fares nationwide. TCAFSR spans from 1.6400 to 0.040, with a Standard Deviation of 1.46419, suggesting a normal distribution. The Median TCAFSR value is 0.530. Additionally, the average percentage increase in the inflation rate following subsidy removal (IRAFSR) is 0.3282, corresponding to a 33% uptick in inflation. IRAFSR ranges from 1.6400 to 0.040, with a Standard Deviation of 1.46419, implying normal distribution. The Median IRAFSR value is 0.530. The Jarque-Bera (JB) test, with a probability value of 0.0000, confirms the normal distribution of the analyzed data in this study.

**Table 3***Panel Unit Root Test @ Level*

Variables	t-statistics	Probability
FSR	601.972	0.000
PFSPPs	189.672	0.000
TCAFSR	640.012	0.000
IRAFSR	549.992	0.000

*Source:* National Bureau of Statistics of Nigeria (2023); Financial Reports (2023) of Selected Listed Transportation Firms on Nigerian Exchange Group plc

Table 3 displays the results of unit root tests performed on all variables using the AD-Fisher method, a technique recently utilized by scholars such as Adegbe and Loto (2019) and Inegbedion et al. (2023), among others, within the scope of this study's investigation. The t-statistic for fuel subsidy removed in 2023 (FSR) is 601.972, leading to a corresponding probability value of 0.000 at the specified level. This finding suggests that AFSR is stationary, indicating the absence of a unit root in the data. Similarly, the t-statistic for post-fuel subsidy removal petrol prices (PFSPPs) is 189.672, with a probability value of 0.000 at the specified level, signifying the absence of a unit root in the PFSPPs data. Moreover, the t-statistic for transport costs after fuel subsidy removal (TCAFSR) is 640.012, accompanied by a probability value of 0.000 at the specified level, implying the absence of a unit root in the TCAFSR data. Finally, the t-statistic for the inflation rate after fuel subsidy removal (IRAFSR) is 640.012, with a probability value of 0.000 at the specified level, indicating the absence of a unit root in the IRAFSR data.

**Table 4***Model Selection Test*

Test	t-statistics	Probability/ Decision
F-restricted test (PLS Vs FE)	$\chi^2 = 4.012$	0.0714, Reject $H_0$ and select FE
Hausman test (RE Vs FE)	$\chi^2 = 0.000$	1.000, Accept $H_0$ and select RE
Durbin Watson (DW)	1.501620	

*Source:* National Bureau of Statistics of Nigeria (2023); Financial Reports (2023) of Selected Listed Transportation Firms on Nigerian Exchange Group plc

Table 4 presents the findings from the F-restricted test, which compares the effectiveness of pooled least squares (PLS) and fixed effect (FE) models. The computed chi-square ( $\chi^2$ ) value is 4.012, yielding a probability of 0.0714. These results challenge the null hypothesis, indicating insufficient support for PLS and endorsing the FE model instead. Furthermore, the Hausman test assesses the random effect (RE) model against the fixed effect model (FEM), resulting in a chi-squared statistic ( $\chi^2$ ) of 0.000 and a probability of 1.000. As a result, the null hypothesis favours the RE model. Therefore, the random effect model is considered the most appropriate among the three models examined. Lastly, the

Durbin-Watson (DW) statistic of 1.501620 falls below the minimum threshold of 2, indicating an absence of serial correlation in the dataset.

**Table 5**

*Regression Analysis: Random Effect Model Result*

SERIES: FSR, PFSPPs, TCAFSR, IRAFSR

Model 3: Random Effect, using 72 observations

Dependent variable: FSR

Variables	Co-efficient	Std. Error	t-Statistic	P-value
Constant	0.610766	0.321222	1.743	0.0007
PFSPPs	-3.300230	0.218442	2.111	0.0095
TCAFSR	-2.282410	0.249111	2.001	0.0021
IRAFSR	0.016631	0.232102	2.451	0.0140
R-Square	0.737993			
Adjusted R <sup>2</sup>	-0.687993			

*Source:* National Bureau of Statistics of Nigeria (2023); Financial Reports (2023) of Selected Listed Transportation Firms on Nigerian Exchange Group plc

Table 5 presents the findings from the analysis using the random effect model. Notably, the coefficient associated with post-fuel subsidy removal petrol prices (PFSPPs) is negative (-3.300230) and statistically significant (0.0095). This suggests that a 330% increase in fuel prices can be attributed to removing fuel subsidies. Similarly, the beta coefficient for transport cost after fuel subsidy removal (TCAFSR) is negative (-2.282410) and statistically significant (0.0021), indicating that a 228% increase in transport costs following the removal of fuel subsidies correlates with the increase in fuel prices in Nigeria. Furthermore, the coefficient for inflation rate after fuel subsidy removal (IRAFSR) is positive (0.016631) and statistically significant (0.0140), implying that the removal of fuel subsidies has resulted in a 16.6% increase in inflation rates in Nigeria.

Moreover, the R-squared (R<sup>2</sup>) value of 0.658327 suggests that 66% of the variance in fuel prices, transport fares, and inflation rate can be explained by removing fuel subsidies, with the remaining 34% attributed to the error term. The adjusted R-squared (adjusted R<sup>2</sup>) of -0.627600 indicates that even after considering other variables in the error term, removing fuel subsidies in Nigeria would still account for a -62% negative effect on fuel prices, transport fares, and inflation rate.

#### 4.1 Discussion of the Findings

The findings of this study highlight the significant and multifaceted financial implications of fuel subsidy removal on fuel prices, transportation costs, Nigerian transportation companies and broader global economic metrics, particularly in the

context of Nigeria. The quantitative examination, facilitated by a well-fitted random effect model, elucidates several critical points. Firstly, the negative and statistically significant coefficients associated with post-fuel subsidy removal, petrol prices and transport costs after fuel subsidy removal underscore a substantial increase in fuel prices and transportation expenses following subsidy removal. This increase suggests that fuel subsidies are crucial in stabilizing fuel prices and that their removal significantly burdens consumers.

Secondly, transportation costs also experience a noteworthy increase post-subsidy removal. The analysis indicates a 228% increase in transport fares, directly correlated with the rise in fuel prices. This finding suggests that removing fuel subsidies affects fuel prices and has financial implications across the transportation sector, ultimately burdening consumers and businesses reliant on transportation networks.

Thirdly, the study highlights the impact of fuel subsidy withdrawal on inflation rates. The analysis shows a significant 16.6% increase in inflation rates following subsidy removal. This finding suggests that fuel subsidy removal contributes to broader economic instability, affecting the purchasing power of consumers and potentially dampening economic growth. The finding underscores the interconnectedness of fuel subsidies with broader macroeconomic indicators, emphasizing the need for policymakers to consider the inflationary consequences of subsidy removal. The findings above align with prior research conducted by Tober (2011), Bazilian and Onyeji (2012), Al-Shehabi (2013), Ouyang and Huang (2015), Anyanwu (2016); Akinwale and Koya (2017); Alabi and Osabuohien (2017); Adegbe and Loto (2019) and Costantini and Paglialunga (2023) highlighting the pervasive nature of the impact of subsidy removal on individuals, organizations and economy.

Moreover, the high explanatory power of the model, as indicated by the R-squared value, suggests that a substantial portion of the variance in fuel prices, transport fares, and inflation rate can be attributed to the removal of fuel subsidies. This finding underscores the central role of subsidy policies in shaping economic outcomes, highlighting the need for policymakers to carefully evaluate the trade-offs associated with subsidy reform.

#### *4.2 Implications of the Findings*

The study highlights the significant burden that fuel subsidy removal places on consumers and businesses, with a 228% increase in transportation costs and a 16.6% increase in inflation rates. The policy recommendation is to introduce targeted safety nets, such as cash transfer programs for low-income households, and gradually phase out the subsidies to mitigate economic shocks.

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## 5. Conclusion and Recommendations

In conclusion, the findings of this study provide robust evidence of the significant and multifaceted financial implications of fuel subsidy removal on fuel prices, transportation costs, and companies, as well as broader economic metrics in Nigeria. The negative coefficients associated with fuel prices and transport costs, coupled with the positive coefficient of inflation rates, underscore the adverse consequences of subsidy removal on consumers, businesses, and the overall economy. These findings underscore the importance of adopting a nuanced approach to subsidy reform, considering the diverse implications for stakeholders and the broader macroeconomic context.

This study contributes to the existing literature by providing a comprehensive quantitative examination of the financial implications of fuel subsidy withdrawal on fuel prices, transportation costs, and inflation rates. The study offers nuanced insights into the complex interactions between subsidy policies and economic outcomes by employing a well-fitted random effect model and considering multiple economic metrics. The findings of this study have significant implications for policymakers grappling with the challenge of subsidy reform. By elucidating the adverse impacts of subsidy withdrawal on fuel prices, transportation costs, and inflation rates, the study underscores the importance of adopting targeted mitigation strategies to alleviate the burden on vulnerable populations and mitigate broader macroeconomic risks.

Given the adverse impacts of subsidy removal on vulnerable populations, the study recommends that policymakers should prioritize the implementation of targeted social safety nets to mitigate the adverse effects of subsidy reform. These safety nets could include cash transfer programs, targeted subsidies for essential goods and services, and investments in social infrastructure to enhance access to basic services. In addition, recognizing the potential for abrupt subsidy withdrawal to exacerbate economic vulnerabilities, policymakers should consider a phased approach to subsidy reform. This approach would involve gradual reductions in subsidy levels, accompanied by measures to enhance energy efficiency, promote alternative energy sources, and strengthen social safety nets. Policymakers can mitigate short-term economic shocks by phasing in subsidy reforms while laying the groundwork for sustainable and inclusive growth.

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