

AN EMPIRICAL ANALYSIS OF FIRM-LEVEL EFFECTS OF FUEL SUBSIDY REMOVAL ON PROFITABILITY OF LISTED OIL AND GAS SECTOR IN NIGERIA

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Abstract

This study empirically examines the firm-level effects of fuel subsidy removal on the profitability of Nigeria's listed oil and gas sector, following the 2023 policy reforms under the Renewed Hope administration. The research is motivated by the need to understand how macroeconomic reforms, particularly the elimination of fuel subsidies, impact the microeconomic performance of key industry players. Utilizing a census-based panel dataset of all seven oil and gas firms listed on the Nigerian Exchange Group from 2014 to 2024, the study employs fixed effects panel regression to analyze the relationship between subsidy removal, firm age, and net profit margin. The findings reveal that subsidy removal is associated with a statistically significant decline in net profit margin, with an average reduction of 1.6 percentage points post-reform. Contrary to expectations, older firms experienced a greater decline in profitability, suggesting that legacy firms may face structural challenges in adapting to abrupt policy changes. The results highlight the dual challenge faced by downstream oil and gas firms: managing increased input costs and navigating a price-sensitive market amid inflationary pressures. The study underscores the importance of firm-level analysis in evaluating the broader consequences of macroeconomic reforms and calls for targeted transitional support to mitigate adverse effects on firm performance. Policy implications include the need for phased implementation, efficiency grants, and tailored support for both older and newer firms. The research contributes to the literature by providing robust empirical evidence on the microeconomic impacts of subsidy reforms and offers actionable insights for policymakers, investors, and stakeholders in Nigeria's petroleum sector.

Keywords: Fuel subsidy removal; profitability; oil and gas firms; economic reforms; firm age; downstream sector

1.0 Introduction

The removal of fuel subsidies in Nigeria, implemented in 2023, was not an isolated policy action but a central component of the broader fiscal and economic reform agenda introduced by the Renewed Hope administration (President Bola Ahmed Tinubu, 2023). Alongside measures such as exchange rate unification, tax system modernization, and public expenditure rationalization, subsidy removal was designed to address deep-seated macroeconomic vulnerabilities and promote sustainable national development. Understanding the micro-level (firm) impacts of these reforms is crucial for evaluating their overall effectiveness and for informing future policy

adjustments, particularly as the government seeks to balance fiscal sustainability with inclusive growth.

Historically, fuel subsidies were introduced to cushion consumers from volatile global oil prices and to promote social welfare, especially for low-income households (Olaoye, 2024; Ozili & Obiora, 2023). However, over time, the fiscal burden of subsidies compounded by inefficiencies, corruption, and leakages prompted successive governments to pursue subsidy reforms as a means of achieving fiscal sustainability and economic efficiency (Osho, 2025; Inegbedion et al., 2020).

The most recent phase of subsidy removal has triggered significant changes in the cost structure and profitability dynamics of firms operating in the downstream oil and gas sector (Olaoye, 2024; Aniemeké, 2024). While the policy is expected to free up government resources for infrastructure and social investment, it has also led to higher fuel prices, increased transportation costs, and inflationary pressures, which directly and indirectly affect the profitability of oil and gas firms (Ayanlowo et al., 2025; Mohammed et al., 2024). The downstream sector, in particular, faces the dual challenge of adjusting to higher input costs and managing consumer demand in a price-sensitive market (Gamette & Oteng, 2024).

Empirical evidence suggests that subsidy removal can have both positive and negative effects on firm performance. On one hand, the elimination of subsidies may improve government fiscal space and reduce market distortions, potentially fostering a more competitive and efficient industry (Ayanlowo et al., 2025; Osho, 2025; Uche, 2025). On the other hand, the immediate aftermath often includes higher input costs, increased tax burdens, and reduced consumer demand, all of which can erode profit margins and threaten the financial sustainability of firms (Inegbedion et al., 2020; Olaoye, 2024; Bamidele et al., 2024). For listed oil and gas firms, these changes necessitate strategic adjustments in pricing, cost management, and financial planning (Bamidele et al., 2024; Olaoye, 2024).

Despite the policy relevance, there is a paucity of firm-level studies that quantitatively assess the impact of subsidy removal on profitability, especially using recent panel data and robust econometric techniques. Previous research has largely focused on macroeconomic outcomes such as inflation, GDP growth, and government revenue (Ozili & Obiora, 2023; Aniemeké, 2024; Ayenigba, 2025) or sector-wide effects (Gamette & Oteng, 2024; Osho, 2025), with limited attention to how subsidy reforms affect the financial performance of individual firms. Studies such as Olaoye (2024) and Inegbedion et al. (2020) have highlighted the need for micro-level analysis, noting that firm-specific factors like firm age and financial leverage can moderate the effects of subsidy removal on profitability (Bamidele et al., 2024; Olaoye, 2024). In line with empirical approaches that use policy event dummies to capture the impact of major reforms, this study operationalizes subsidy removal as a binary variable, distinguishing between periods before and after the 2023 policy change.

Furthermore, the Nigerian oil and gas sector is characterized by a small number of dominant players, with only seven firms listed on the Nigerian Exchange Group as of 2024. This unique structure provides an opportunity for comprehensive census-based analysis, which can yield more generalizable insights for the sector (Bamidele et al., 2024). The use of panel data from

2014 to 2024 allows for the assessment of both short-term shocks and longer-term adjustments in firm profitability following subsidy reforms (Ayanlowo et al., 2025; Olaoye, 2024).

While macroeconomic analyses have highlighted the effects of these reforms on inflation, fiscal deficits, and national development indicators, there remains a significant gap in the literature regarding their impact at the firm level. Specifically, the downstream oil and gas sector, which is directly affected by subsidy removal, provides a unique lens through which to assess the real-world consequences of Nigeria's ongoing economic transformation. The specific objectives of this study are to examine the impact of fuel subsidy removal (dummy variable) on the profitability of listed oil and gas firms in Nigeria; investigate the role of firm age as a control variable in moderating the effects of subsidy removal on profitability; and provide empirical evidence to inform policymakers, investors, and stakeholders on the microeconomic consequences of fuel subsidy reforms in Nigeria's petroleum sector.

2.0 Literature Review

Fuel subsidy refers to government interventions that reduce the retail price of petroleum products below market equilibrium, typically through direct payments to importers or price controls (Coady et al., 2019; Olaoye, 2024; Ozili & Obiora, 2023). In Nigeria, subsidies have historically been justified as a means to protect consumers from volatile global oil prices, promote social welfare, and support economic stability (Osho, 2025; IMF, 2023). However, persistent subsidies have also been widely criticized for encouraging inefficiency, smuggling, and fiscal leakages, thereby undermining public finances and distorting market incentives (Inegbedion et al., 2020; Coady et al., 2019; World Bank, 2023).

Rationale and Consequences of Subsidy Removal

The removal of fuel subsidies is typically motivated by the need to reduce fiscal deficits, eliminate market distortions, and reallocate government resources to more productive sectors such as infrastructure, health, and education (Ayanlowo et al., 2025; Uche, 2025; IMF, 2023). Empirical evidence from Nigeria and other developing economies suggests that subsidy removal can improve government finances and market efficiency but often leads to higher fuel prices, increased transportation costs, and inflationary pressures, with adverse effects on households and businesses (Mohammed et al., 2024; Gamette & Oteng, 2024; Coady et al., 2019; Sdravovich et al., 2014). In this study, subsidy removal is conceptualized as a policy event, operationalized through a dummy variable distinguishing between periods before and after the 2023 reform. This approach aligns with empirical literature that uses policy dummies to capture the effects of major economic reforms (Adenikinju, 2009; Ozili & Obiora, 2023; Rentschler & Bazilian, 2017).

Profitability in Oil and Gas Firms

Profitability is a key indicator of firm performance and sustainability, commonly measured by metrics such as net profit margin, return on assets, and return on equity (Bamidele et al., 2024; Olaoye, 2024; Nnajeze et al., 2025). For oil and gas firms, profitability is influenced by a range of factors including input costs, government policies, tax expenses, and market demand (Doucouliagos et al., 2022). The removal of subsidies directly affects the cost structure of these firms, potentially reducing profit margins if cost increases cannot be fully passed on to consumers (Inegbedion et al., 2020; Olaoye, 2024; Rentschler, 2016). While tax expense is

recognized as a factor influencing profitability, it is not included as an explanatory variable in this study's empirical model, which focuses on the direct effect of subsidy removal and the moderating role of firm age.

Firm Age and Resilience to Policy Shocks

Firm age is often considered a proxy for experience, stability, and adaptability in the face of external shocks such as policy reforms (Bamidele et al., 2024; Coad & Tamvada, 2012). Older firms may possess established market positions, diversified operations, and greater access to financial resources, enabling them to better withstand the negative impacts of subsidy removal compared to newer entrants (Hassan Ali & Fatima, 2023; Ducuara Parales et al., 2024).

Market Structure and Competitive Dynamics

The Nigerian oil and gas sector is characterized by a small number of dominant, listed firms, which shapes the competitive landscape and influences how subsidy removal impacts profitability (Bamidele et al., 2024; Uche, 2025). Market structure determines the extent to which firms can adjust prices, manage costs, and maintain profitability in response to policy changes (Gamette & Oteng, 2024; Rentschler & Bazilian, 2017).

Theoretical Review

Several theoretical frameworks underpin the analysis of fuel subsidy removal and firm profitability. Resource Allocation Theory posits that subsidies can lead to inefficient allocation of resources by distorting market prices and incentivizing overconsumption or misallocation (Osho, 2025; Uche, 2025; Coady et al., 2019). By removing subsidies, governments aim to correct these distortions, promote efficiency, and enhance fiscal sustainability.

Institutional Theory emphasizes the role of strong institutions, transparency, and accountability in the successful implementation of reforms and their outcomes for firms (North, 1990; World Bank, 2023). In the Nigerian context, recent reforms have included digitalization of public finance and enhanced fiscal governance, which may influence how firms adapt to policy shocks.

Keynesian Economic Theory highlights the importance of government intervention through spending, investment, and regulatory reforms in stabilizing the economy and supporting growth, especially during periods of adjustment (Keynes, 1936; Sdravovich et al., 2014). This perspective suggests that the success of subsidy removal in promoting firm profitability depends not only on the policy measures themselves but also on the broader macroeconomic environment and the presence of compensatory government actions.

Agency Theory is also relevant, particularly in the context of corporate governance and firm response to policy shocks. According to this theory, managers may respond to subsidy removal by adjusting operational strategies, cost structures, and investment decisions to protect shareholder value (Bamidele et al., 2024; Jensen & Meckling, 1976). The effectiveness of these responses depends on the quality of internal controls, financial leverage, and managerial expertise.

Additionally, Shock Transmission Theory explains how external shocks, such as subsidy removal, are transmitted through the economy and affect firm-level outcomes. This theory suggests that the impact of subsidy removal on profitability is mediated by firm-specific factors such as age, size, and financial structure, as well as by broader macroeconomic variables like inflation and exchange rates (Ayanlowo et al., 2025; Ayenigba, 2025; Rentschler, 2016).

Empirical Review

Empirical studies on the impact of fuel subsidy removal in Nigeria and other oil-producing economies have produced mixed findings. Olaoye (2024) found that the removal of fuel subsidies led to increased fuel prices and transportation costs, which in turn contributed to inflation and reduced profit margins for oil and gas firms. Similarly, Inegbedion et al. (2020) reported that subsidy withdrawal resulted in higher operating costs and lower profitability, particularly in the downstream sector. Many empirical studies, especially those examining the effects of policy changes, employ dummy variables to represent the presence or absence of subsidies or other major reforms (Adenikinju, 2009; Ozili & Obiora, 2023). This methodological approach allows researchers to isolate the impact of the policy event on firm performance. In line with this, the present study adopts a policy dummy variable to measure the effect of subsidy removal on profitability.

Ayanlowo et al. (2025) employed econometric techniques to assess the macroeconomic and firm-level effects of subsidy removal, concluding that the policy had a significant negative impact on key indicators such as net profit margin and return on assets. Mohammed et al. (2024) highlighted the broader socioeconomic consequences, noting that subsidy removal adversely affected consumption patterns, savings, and investment, with spillover effects on firm performance.

Further, Osho (2025) examined the relationship between oil subsidy regimes and Nigeria's economic growth, finding that while subsidy removal can improve fiscal sustainability, it may also exacerbate budget deficits and debt sustainability challenges if not managed alongside broader economic reforms. Ozili and Obiora (2023) provided evidence that subsidy removal, while necessary for fiscal health, can trigger inflationary pressures and reduce disposable income, indirectly affecting the profitability of oil and gas firms through weakened consumer demand.

Several studies have also explored the microeconomic mechanisms through which subsidy removal affects firm performance. Bamidele et al. (2024) found that older and more established firms exhibited greater resilience to subsidy shocks due to their operational experience and market presence. This is consistent with findings from international contexts, where firm age and financial leverage have been shown to influence the ability to adapt to policy changes (Hassan Ali & Fatima, 2023; Ducuara Parales et al., 2024). Olaoye (2024) demonstrated that higher tax burdens further eroded profitability in the post-subsidy era, emphasizing the compounding effect of fiscal policy on firm outcomes.

In addition, empirical evidence from sectoral and cross-country analyses provides further insights. Gamette and Oteng (2024) reviewed the experiences of global south oil-producing

economies and concluded that subsidy removal can foster greater competition and efficiency in the long run, but may also lead to short-term disruptions and financial instability for less competitive firms. Uche (2025) emphasized the need for gradual and well-managed transitions to avoid adverse effects on inflation and living standards. Ayenigba (2025) analyzed the inflationary effects of fuel price fluctuations in Nigeria, finding a strong positive correlation between subsidy removals, rising fuel prices, and inflation, which ultimately impacts firm profitability.

Moreover, empirical studies such as Aniemeke (2024) and Nnajieze et al. (2025) have shown that the effects of subsidy removal are not uniform across all firms. Firm-specific factors such as liquidity, working capital management, and environmental cost disclosures can moderate the impact of subsidy reforms on profitability. For instance, Nnajieze et al. (2025) found that effective management of short-term financial obligations can help oil and gas firms mitigate the negative effects of subsidy removal on profit margins.

Sector-wide analyses have also underscored the importance of market structure and competition. The Nigerian oil and gas sector, characterized by a small number of dominant listed firms, may experience different adjustment dynamics compared to more fragmented markets (Bamidele et al., 2024). The ability of firms to pass on increased costs to consumers, invest in efficiency improvements, and leverage economies of scale can determine the extent to which profitability is affected by subsidy reforms.

In summary, the empirical literature suggests that the impact of fuel subsidy removal on profitability is context-specific and mediated by a range of firm-level and macroeconomic factors. While subsidy removal can enhance efficiency and fiscal sustainability, it also poses significant challenges for oil and gas firms, particularly in the immediate aftermath of reform. The evidence underscores the importance of firm characteristics, market structure, and complementary policy measures in shaping the outcomes of subsidy reforms in Nigeria's oil and gas sector.

3.0 Methodology

This study adopts an ex post facto research design, which is appropriate for investigating the impact of policy changes such as fuel subsidy removal on firm performance using historical data. The design enables the analysis of relationships among variables without manipulating the study environment, thus ensuring the validity of findings in a real-world context. Panel data covering the period from 2014 to 2024 is utilized, allowing for both cross-sectional and time-series analysis of listed oil and gas firms in Nigeria. The population of the study comprises all oil and gas firms listed on the Nigerian Exchange Group (NGX) as of 2024. A census approach is adopted due to the manageable size of the population, ensuring comprehensive coverage and eliminating sampling bias. The total population consists of seven (7) firms.

Table 1:

Population of the Study-Listed Oil and Gas Firms on NGX (2024)

S/N	Company Name	Ticker	Year of Incorporation
1	Aradel Holdings Plc	ARADEL	1992
2	Conoil Plc	CONOIL	1970

3	Eterna Plc	ETERNA	1989
4	Japaul Gold & Ventures Plc	JAPAU LGOLD	1994
5	Oando Plc	OANDO	1969
6	Seplat Energy Plc	SEPLAT	2009
7	TotalEnergies Marketing Nigeria Plc	TOTAL	1956

Source: Nigerian Exchange Group (2025).

Given the small and manageable population size, the study employs a census sampling technique. All seven listed oil and gas firms are included in the analysis, resulting in a total of 77 firm-year observations (7 firms × 11 years). Secondary data were sourced from the annual reports, statements of profit or loss, and notes to the financial statements of the listed oil and gas firms. These documents provide comprehensive and reliable information on financial performance and other relevant firm characteristics.

Measurement of Variables

The study employs the following variables and measurement approaches:

Variable	Proxy	Measurement
Subsidy Removal	Dummy variable	0 = before 2023, 1 = 2023 and after
Profitability	Net Profit Margin	Net Profit ÷ Revenue
Firm Age	Control	Year – Incorporation year

Source: Authors' Computation (2026).

Model Specification

To examine the impact of fuel subsidy removal on the profitability of listed oil and gas firms in Nigeria, the following panel regression model is specified:

$$NPM_{it} = \beta_0 + \beta_1 SUBREM_t + \beta_2 FAGE_{it} + \mu_{it}$$

Where:

$$NPM_{it} = \text{Net Profit Margin}$$

$$SUBREM_t = \text{Subsidy removal dummy variable (0 = before 2023, 1 = 2023 and after)}$$

$$FAGE_{it} = \text{Firm age (current year minus year of incorporation)}$$

$$\beta_0 = \text{Intercept}$$

$$\beta_1, \beta_2 = \text{Coefficients of explanatory variables}$$

$$\mu_{it} = \text{Error term}$$

The model will be estimated using panel data regression techniques, specifically fixed effects and random effects models. The Hausman test will be conducted to determine the most appropriate estimator. Diagnostic tests such as the Variance Inflation Factor (VIF), heteroscedasticity, and autocorrelation tests will be performed to ensure the robustness of the results.

4.0 Results and Discussion

Table 2:
Descriptive Statistics of Study Variables (2014-2024)

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis	Jarque-Bera (p-value)
NPM	77	0.0884	0.0287	0.021	0.142	0.31	2.67	0.21
SUBREM	77	0.18	0.39	0	1	1.68	3.82	0.00
FIRM_AGE	77	36.3	18.2	5	68	0.12	2.54	0.13

Source: Authors’ Computation (2026).

Table 2 presents the descriptive statistics for the main variables. The mean NPM is 8.84%, with a standard deviation of 2.87%, indicating moderate profitability and some variation across firms and years. The SUBREM dummy has a mean of 0.18, reflecting that only 18% of the firm-year observations fall in the post-subsidy removal period (2023 and after). Firm age averages 36.3 years, with a range from 5 to 68 years, suggesting a mix of both established and relatively newer firms in the sample. The skewness and kurtosis values for NPM and FIRM_AGE are close to normal, while SUBREM is highly skewed (as expected for a policy dummy). The Jarque-Bera test indicates that NPM and FIRM_AGE are approximately normally distributed ($p > 0.05$), supporting the suitability of parametric regression techniques.

Correlation Analysis

Table 3:
Correlation Matrix of Study Variables

Variable	NPM	SUBREM	FIRM_AGE
NPM	1.000000		
SUBREM	-0.553717	1.000000	
FIRM_AGE	0.178318	0.123138	1.000000

Source: Authors’ Computation (2026).

The correlation matrix reveals a strong negative correlation between subsidy removal and net profit margin ($r = -0.55$), suggesting that the removal of fuel subsidies is associated with a decline in profitability among listed oil and gas firms. Firm age is positively correlated with NPM ($r = 0.18$), indicating that older firms tend to be more profitable, possibly due to greater experience and resilience. The low correlations among independent variables suggest minimal risk of multicollinearity.

Panel Unit Root and Cointegration Tests

Table 4:

Pedroni Residual Cointegration Test Results

Statistic	Statistic Value	Prob.	Decision (5%)
Panel v-Statistic	0.842	0.200	Not Significant
Panel rho-Statistic	-0.912	0.181	Not Significant
Panel PP-Statistic	-2.314	0.010	Significant
Panel ADF-Statistic	-2.127	0.017	Significant
Group rho-Statistic	-0.745	0.228	Not Significant
Group PP-Statistic	-2.401	0.008	Significant
Group ADF-Statistic	-2.215	0.014	Significant

Source: Authors' Computation (2026).

The Pedroni residual cointegration test results show that several statistics (Panel PP-Statistic, Panel ADF-Statistic, Group PP-Statistic, Group ADF-Statistic) are significant at the 5% level, rejecting the null hypothesis of no cointegration. This indicates a long-run equilibrium relationship among NPM, SUBREM, and FIRM_AGE, justifying the use of panel regression models for inference.

**Regression Results
Model Selection**

Table 5:

Model Selection and Hausman Test Results

Test/Model	Statistic/Value	Degrees of Freedom	p-value	Decision/Interpretation
Hausman Test	55.022	2	0.0000	Fixed effects preferred

Source: Authors' Computation (2026).

Three panel regression models were estimated: pooled OLS, fixed effects, and random effects. The Hausman test ($\chi^2 = 55.02$, $p < 0.01$) strongly favors the fixed effects model as the appropriate estimator, indicating that unobserved firm-specific effects are correlated with the regressors.

Fixed Effects Regression Results

Table 6:

Fixed Effects Regression Results (Dependent Variable: Net Profit Margin, NPM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SUBREM	-0.016003	0.004243	-3.771290	0.0003
FIRM_AGE	-0.004522	0.000518	-8.737022	0.0000

C	0.255429	0.018311	13.94925	0.0000
Model Statistic	Value			
R-squared	0.876408			
Adjusted R-squared	0.861867			
S.E. of regression	0.010651			
F-statistic	60.27454			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.036781			

Source: Authors' Computation (2026).

The fixed effects results show that subsidy removal (SUBREM) has a negative and statistically significant effect on net profit margin ($\beta = -0.016$, $p < 0.01$), indicating that the removal of fuel subsidies led to a 1.6 percentage point decrease in profitability for listed oil and gas firms, holding other factors constant. Firm age (FIRM_AGE) is also negative and significant ($\beta = -0.0045$, $p < 0.01$), suggesting that older firms experienced a greater decline in profitability following subsidy removal. The model explains a high proportion of the variance in profitability ($R^2 = 0.88$), indicating strong explanatory power.

Robustness and Diagnostics

Residual diagnostics indicate that the standardized residuals are approximately normally distributed, with minor skewness and kurtosis. The Jarque-Bera test for residuals is marginally significant ($p = 0.045$), suggesting slight deviations from normality but not enough to invalidate the results. The Durbin-Watson statistic (1.04) is close to 2, indicating no serious autocorrelation. The low standard error of regression and high F-statistic further support model adequacy.

Multicollinearity Test (Variance Inflation Factor - VIF)

To assess the presence of multicollinearity among the independent variables, the Variance Inflation Factor (VIF) was computed for each regressor. As shown in Table 7, all VIF values are well below the commonly accepted threshold of 10, indicating that multicollinearity is not a concern in the model.

Table 7:
Variance Inflation Factor (VIF) Results

Variable	VIF
SUBREM	1.03
FIRM_AGE	1.02

Note: VIF values below 10 indicate no serious multicollinearity (Gujarati & Porter, 2009).

Source: Authors' Computation (2026).

Heteroscedasticity Test

To check for heteroscedasticity in the panel regression model, the Breusch-Pagan/Cook-Weisberg test was conducted. The results are presented in Table 8.

Table 8:
Heteroscedasticity Test Results

Test	Chi-Square	p-value	Decision
Breusch-Pagan/Cook-Weisberg Test	1.27	0.259	No heteroscedasticity

Source: Authors' Computation (2026).

The test results indicate that the null hypothesis of homoscedasticity cannot be rejected ($p > 0.05$), suggesting that the variance of the residuals is constant across observations.

Discussion of Findings

The empirical findings provide robust evidence that the removal of fuel subsidies in Nigeria has had a significant negative impact on the profitability of listed oil and gas firms. The magnitude of the effect is economically meaningful, with net profit margins declining by an average of 1.6 percentage points post-reform. This supports the argument that, while subsidy removal may improve fiscal sustainability at the macro level, it imposes substantial adjustment costs on firms in the downstream sector, at least in the short run. This negative impact can be attributed to several macroeconomic mechanisms triggered by the subsidy removal and related reforms. The immediate increase in fuel prices led to higher transportation and production costs, contributing to cost-push inflation across the economy (World Bank, 2023). Concurrently, the exchange rate unification policy resulted in currency depreciation, which increased the cost of imported inputs for oil and gas firms (IMF, 2023). These factors, combined with rising inflation, reduced consumer purchasing power and aggregate demand, further constraining firm revenues and profitability (Sdravovich et al., 2014; World Bank, 2023). The resulting inflationary pressures have also contributed to increased poverty rates, with over four million Nigerians falling below the poverty line in the aftermath of these reforms (World Bank, 2023).

The negative effect of firm age on profitability post-subsidy removal is noteworthy. It suggests that older firms, despite their experience, may face greater challenges in adapting to abrupt policy changes, possibly due to rigid cost structures or less agile management practices. This finding highlights the need for targeted support and capacity-building for legacy firms during major policy transitions.

The financial health of oil and gas firms is closely linked to Nigeria's broader development objectives. As major contributors to government revenue and employment, the profitability of these firms affects the fiscal space available for public investment in infrastructure, health, and education (World Bank, 2023). A sustained decline in profitability may also deter new investment in the sector, limiting job creation and technological advancement. Therefore, while subsidy removal may support fiscal sustainability in the long term, its short-term adverse effects on firm performance highlight the need for complementary policies such as targeted support and transparent reinvestment of fiscal savings to safeguard national development goals (Coady et al., 2019; Rentschler & Bazilian, 2017).

These results are consistent with the Shock Transmission Theory, which posits that the impact of external shocks is mediated by firm-specific characteristics and market structure. The strong negative correlation between subsidy removal and profitability also aligns with the empirical

literature (Olaoye, 2024; Mohammed et al., 2024; Ayanlowo et al., 2025), which documents similar patterns in other oil-producing economies.

Limitations of the Study

Despite the robustness of the methodology and the relevance of the findings, this study is subject to certain limitations. First, the analysis is based on a relatively small sample size, comprising only seven listed oil and gas firms in Nigeria. While this census approach ensures comprehensive sectoral coverage, it may limit the generalizability of the results to the broader oil and gas industry or to non-listed firms.

Second, the study relies on secondary data obtained from published financial statements, which may not capture all firm-level nuances. In particular, the lack of consistent and publicly available data on firm-level subsidy receipts or direct government transfers constrains the ability to precisely quantify the magnitude of subsidy exposure for each firm. As a result, the study employs a policy dummy variable to proxy for the impact of subsidy removal, which, while methodologically sound, may not fully capture firm-specific variations in subsidy dependence.

Finally, other potentially relevant variables such as firm leverage, liquidity, or market share were not included in the main regression model due to data availability constraints. Future research could address these limitations by incorporating a larger sample, including non-listed firms, and utilizing more granular firm-level data.

Conclusion

This study examined the impact of fuel subsidy removal on the profitability of listed oil and gas firms in Nigeria, using panel data from 2014 to 2024 and robust econometric techniques. The analysis was motivated by the significant policy shift in 2023, which saw the Nigerian government eliminate fuel subsidies a move with far-reaching implications for the downstream petroleum sector. The empirical results provide clear evidence that the removal of fuel subsidies has had a significant and negative effect on the net profit margins of listed oil and gas firms. Specifically, the fixed effects regression results indicate that subsidy removal is associated with a 1.6 percentage point decline in net profit margin, holding other factors constant. This finding is consistent with the literature, which highlights the immediate adverse effects of subsidy reforms on firm profitability due to increased input costs, inflationary pressures, and reduced consumer demand.

Contrary to some expectations, the study also finds that older firms experienced a greater decline in profitability following subsidy removal. This suggests that legacy firms, despite their experience and market presence, may face structural challenges in adapting to abrupt policy changes, possibly due to higher fixed costs and less operational flexibility. The results underscore the importance of considering firm-level characteristics and market structure when assessing the microeconomic consequences of major policy reforms. While subsidy removal may enhance fiscal sustainability and market efficiency in the long run, it also imposes significant short-term adjustment costs on firms, particularly in concentrated sectors like oil and gas.

Policy Implications:

The findings highlight the need for transitional support measures such as targeted tax relief, efficiency grants, or phased implementation to help firms adjust to the new cost environment. Policymakers should also consider the heterogeneity among firms, ensuring that support mechanisms are tailored to the specific needs of both older and newer market participants.

Recommendations for Future Research:

Future studies could extend this analysis by incorporating additional firm-level variables such as financial leverage, liquidity, and market share, or by exploring the effects of subsidy removal on non-listed firms and other sectors of the economy. Longitudinal studies examining the medium- and long-term impacts of subsidy reforms would also provide valuable insights for policymakers and industry stakeholders. In conclusion, while the removal of fuel subsidies is a necessary step toward fiscal sustainability, careful management of the transition process is essential to safeguard the financial health and competitiveness of Nigeria's oil and gas sector.

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