OPEN ACCESS

Middle East Research Journal of Humanities and Social Sciences
ISSN 2789-7761 (Print) | ISSN 2958-2040 (Online)
Frequency: Bi-Monthly
DOI: https://doi.org/10.36348/merjhss.2025.v05i06.005

KUWAIT SCHOLARS PUBLISHER
Website: http://www.kspublisher.com/
Email: office@kspublisher.com

The Role of Petroleum Subsidy Reforms in Driving Equitable Development: A Welfare and Productivity Analysis for Nigeria

KUNEMOEMI, Zacchaeus[1*]
[1]Department of Economics and Development Studies, Faculty of Social Sciences, Federal University Otuoke, Bayelsa State

Abstract: This study investigates the role of petroleum subsidy reforms in driving equitable development in Nigeria through a comprehensive welfare and productivity analysis. Motivated by the long-standing fiscal burden and inefficiencies associated with Nigeria's fuel subsidy regime, the study investigates how the removal and restructuring of subsidies influence key welfare indicators such as household consumption, poverty levels, and human development as well as productivity outcomes including real GDP per capita, total factor productivity, manufacturing output, and SME performance. Using annual time-series data spanning 1990 to 2024, the study adopts an ex post facto research design and employs econometric techniques, including the Philip–Perron unit root test, Johansen cointegration test, and Error Correction Model (ECM), to analyze both short-run dynamics and long-run relationships. The empirical findings reveal that all variables are integrated of order one, and a long-run equilibrium relationship exists between petroleum subsidy reforms and equitable development indicators. The ECM results show that petroleum subsidy reform intensity, as well as the reallocation of subsidy savings to social and capital expenditures, exerts a positive and statistically significant impact on welfare and productivity outcomes. Specifically, investments in social sectors such as education and healthcare improve human development, while capital expenditure enhances economic productivity. Furthermore, fuel price adjustments following subsidy removal are found to promote efficiency and resource allocation, thereby supporting productivity growth in the long run. However, the study also finds that inflation induced by subsidy reforms has a negative and significant effect on welfare and productivity in the short run, reflecting the immediate cost-of-living pressures experienced by households and businesses. Importantly, targeted social transfers financed from subsidy savings are shown to significantly reduce income inequality and mitigate adverse welfare effects, particularly for vulnerable populations. The study concludes that petroleum subsidy reforms can serve as a catalyst for equitable development in Nigeria when accompanied by effective policy measures such as strategic reinvestment of savings, robust social protection programs, and sound macroeconomic management.

Keywords: Petroleum Subsidy Reforms, Equitable Development, Welfare, Productivity, Inflation, Social Transfers, Nigeria.

Research Paper

***Corresponding Author:**
KUNEMOEMI, Zacchaeus
Department of Economics and Development Studies, Faculty of Social Sciences, Federal University Otuoke, Bayelsa State

How to cite this paper:
KUNEMOEMI, Zacchaeus (2025). The Role of Petroleum Subsidy Reforms in Driving Equitable Development: A Welfare and Productivity Analysis for Nigeria. *Middle East Res J. Humanities Soc. Sci, 5*(6): 218-232.

Article History:
| Submit: 06.11.2025 |
| Accepted: 09.12.2025 |
| Published: 22.12.2025 |

INTRODUCTION

Nigeria's petroleum subsidy regime has been a defining feature of its economic policy for decades, originally intended to cushion consumers from volatile global oil prices and support broad access to fuel for transportation, industry, and households. The subsidy system, however, became increasingly costly and unsustainable, absorbing significant government revenues that could otherwise be invested in critical development sectors such as education, healthcare, and infrastructure (Aniemeke, 2024). As a result, on May 29, 2023, the Nigerian government formally removed petroleum subsidies, allowing pump prices to be determined by market conditions rather than government mandates. This policy shift is one of the most consequential economic reforms in recent Nigerian history, with wide-ranging implications for public welfare and economic productivity.

The removal of petroleum subsidies was driven by several factors, including the need to reduce fiscal burdens, improve macroeconomic stability, and encourage more efficient allocation of resources within

the economy (Okereke *et al*., 2024; Aniemeke, 2024). Proponents of subsidy reform argue that the previous regime primarily benefited higher-income households and fuel-intensive sectors, effectively functioning as a regressive transfer that failed to deliver proportional gains in social welfare. By reallocating savings from subsidy spending toward investments in productive sectors, the government and its supporters claim that subsidy reform could foster more sustainable and inclusive development outcomes over the long term (Okereke *et al*., 2024).

Despite these intended benefits, the immediate socio-economic impacts of subsidy removal have been mixed and, in many cases, harsh for ordinary Nigerians. Several studies document substantial increases in fuel prices following subsidy removal, which in turn have contributed to higher transportation costs, greater inflationary pressures, and increased costs of essential goods and services (Bisong *et al*., 2023; Addah, 2025). Higher transportation costs have a direct effect on household welfare, particularly for low-income groups that spend a larger share of their income on basic needs. In urban and peri-urban areas, households have faced diminished purchasing power, rising food prices, and overall declines in living standards, suggesting that subsidy reforms without robust social protection measures can exacerbate economic hardship for vulnerable populations.

The welfare implications extend beyond immediate consumption and cost of living. In the Niger Delta region, for example, the removal of subsidies has compounded existing socio-economic challenges in an area already struggling with poverty and limited access to affordable energy. Sharp fuel price increases have amplified transportation expenses, inflating the cost of goods and reducing real incomes, especially for households with limited financial resilience (Udo & Akpan, 2025). The cumulative effect of rising costs without compensatory income growth underscores the complex interplay between subsidy reforms, household welfare, and regional disparities in a highly oil-dependent economy.

Beyond household welfare, petroleum subsidy reforms have also influenced economic productivity and enterprise performance. Micro, small, and medium-sized enterprises (MSMEs), which form the backbone of the Nigerian economy, have confronted higher operational costs due to increased fuel and energy expenses. These cost pressures have, in some instances, dampened production capacity and business growth, particularly for smaller firms with limited access to capital or alternative energy sources (Ekaette *et al*., 2025). As a result, policy discussions increasingly consider the need for targeted support to enhance productivity and facilitate adaptation to the post-subsidy economic environment.

At the macroeconomic level, subsidy removal has yielded some positive fiscal outcomes, including increased government revenue and reduced fiscal deficits. Econometric analysis indicates that removing subsidies can improve fiscal consolidation by alleviating pressure on government budgets, although these gains may be tempered in the short term by inflationary effects and slower GDP growth (Ayanlowo *et al*., 2025). These findings reflect the trade-offs inherent in subsidy reform policies, where short-term welfare costs can accompany long-term fiscal sustainability and economic efficiency.

The Nigerian experience highlights the critical intersection between petroleum subsidy reforms, equitable development, welfare outcomes, and productivity performance. While subsidy removal may improve fiscal health and resource allocation, its social costs—particularly for low-income households and small enterprises—underscore the importance of complementary policies. Social safety nets, targeted support programs, and investments in infrastructure can help mitigate adverse impacts and promote a more equitable distribution of the benefits of reform. Understanding how to balance fiscal prudence with social equity remains central to achieving the broader developmental goals implicit in Nigeria's petroleum subsidy reforms.

The removal of petroleum subsidies in Nigeria has had profound effects on economic welfare and productivity, creating a pressing need to empirically understand the problems policymakers and citizens now face. While the policy was intended to strengthen fiscal sustainability and redirect public resources toward development goals, recent evidence suggests that its consequences have been severe for households, businesses, and broader welfare outcomes. These effects form the core problem that this study seeks to investigate.

One of the central issues emerging from empirical research is the negative impact of subsidy removal on cost of living and inflation. Studies have consistently shown that eliminating subsidies has driven up fuel prices, triggering inflationary pressures that erode household welfare. For example, recent empirical findings indicate that removal of petroleum subsidies significantly increases the cost of living and inflation, with fuel price changes contributing to major increases in consumer costs and broad inflation indicators in Nigeria (Ajuwon & Abiodun, 2026). The study demonstrated that as subsidy removal intensity increases, the cost of living and inflation levels rise sharply, highlighting a direct link between policy change and welfare deterioration.

Closely connected to inflationary outcomes is the documented effect on the Consumer Price Index (CPI) and overall welfare. Research employing rigorous econometric techniques reveals that higher fuel prices and transportation costs following subsidy removal

elevate the CPI, suggesting that households face a sustained increase in the prices of goods and services that depend on fuel inputs (Muhammad *et al*., 2025). This finding underscores how subsidy removal has transmitted cost pressures beyond the petrol sector into general living expenses that affect welfare.

Empirical evidence also points to substantial socio-economic hardships at the household level. Surveys among Nigerian households show that increased fuel costs following subsidy removal have heightened poverty and reduced standards of living by driving up food prices and other basic commodity costs (Addah, 2025). The study's results revealed that the removal of petroleum subsidies contributed to rising food prices and associated financial pressures, disproportionately affecting low-income households that already allocate a large share of their income to basic needs.

Beyond macro-welfare indicators, the adverse effects of subsidy removal extend to productivity and business performance. Evidence from studies on micro, small, and medium enterprises (MSMEs) in Nigeria indicates that the elimination of subsidies has raised input costs, reduced production capacities, and constrained growth prospects (Ekaette *et al*., 2025). By increasing operational costs through fuel price hikes and associated inflationary pressures, subsidy reforms have undermined the competitiveness and sustainability of many firms, with knock-on effects on employment and sectoral productivity.

The problem is further intensified in specific livelihood contexts. Research focusing on commercial drivers in rural Nigeria reveals that subsidy reforms have sharply increased operational costs, sharply reducing drivers' disposable incomes and undermining their ability to invest or save (Yusufu *et al*., 2024). These micro-level impacts demonstrate how subsidy removal has had disproportionate effects on segments of the economy reliant on fuel as a primary input for income generation, thereby exacerbating inequality and threatening equitable development.

Despite the wealth of research documenting welfare and productivity challenges, there remains a lack of comprehensive analysis that directly connects subsidy reforms to equitable development outcomes in a holistic manner. Existing studies tend to focus on isolated effects—such as inflation, cost of living, or business performance—without integrating these findings into a broader assessment of overall welfare and productivity in Nigeria. The fragmented nature of current empirical work limits understanding of how subsidy policy interacts with equity, productivity, and long-term development goals.

Consequently, the key problem this study addresses is the need for integrated empirical evidence on how petroleum subsidy reforms affect welfare and productivity in a way that shapes equitable development outcomes. Without such analysis, policymakers lack the comprehensive perception necessary to design mitigation measures that balance fiscal sustainability with social welfare and economic productivity. This gap explain the urgency of research that synthesizes diverse empirical findings into a coherent framework for policy action.

The main objective of this study is to examine the role of petroleum subsidy reforms in driving equitable development in Nigeria through a welfare and productivity analysis. The specific objectives of the study are to:

i. Examine the effect of petroleum subsidy reform intensity (PSR) on real household consumption expenditure (RHCE) in Nigeria.
ii. Assess the impact of petroleum subsidy reform intensity (PSR) on the poverty rate (POV) in Nigeria.
iii. Determine the effect of petroleum subsidy savings reallocation to social expenditure (PSS) on the human development index (HDI) in Nigeria.
iv. Analyze the influence of petroleum subsidy savings reallocation to capital expenditure (PSC) on real gross domestic product per capita (RGDPPC) in Nigeria.
v. Investigate the effect of post-subsidy fuel price adjustments (FPA) on total factor productivity (TFP) in Nigeria.
vi. Evaluate the impact of post-subsidy fuel price adjustments (FPA) on manufacturing sector output (MSO) in Nigeria.
vii. Examine the effect of petroleum subsidy reform–induced inflation rate (INF) on small and medium enterprise productivity (SMEP) in Nigeria.
viii. Assess the influence of targeted social transfer interventions financed from subsidy savings (TST) on income inequality (GINI) in Nigeria.

This study investigates the role of petroleum subsidy reforms in promoting equitable development in Nigeria, with particular emphasis on how the restructuring or removal of fuel subsidies influences welfare outcomes and productivity performance within the economy. The research is restricted to Nigeria as a single-country case study due to the country's long-standing dependence on petroleum products and the significant role fuel subsidies have played in fiscal policy, household welfare, and economic productivity. Nigeria presents a suitable context for examining subsidy reforms because petroleum subsidies have historically constituted a major component of government expenditure and have been subject to several reform attempts aimed at improving fiscal sustainability and development outcomes.

In terms of content scope, the study focuses on petroleum subsidy reforms as the explanatory variable, measured through indicators such as government expenditure on petroleum subsidies, domestic petroleum product prices, and the subsidy removal or adjustment policy regimes over time. Equitable development represents the outcome variable and is captured through indicators reflecting both welfare and productivity dimensions of the economy. Welfare indicators include measures such as household consumption expenditure, poverty levels, and inflation, while productivity indicators include real gross domestic product growth, labour productivity, and sectoral output performance. These variables are selected to provide a comprehensive understanding of how subsidy reforms affect both the living standards of citizens and the efficiency of economic production.

The study covers the period from 1990 to 2024, a timeframe selected based on the availability of reliable data and the relevance of this period to Nigeria's experience with petroleum subsidy regimes and reform policies. This period captures several important policy episodes, including subsidy adjustments, partial removals, and recent comprehensive reform initiatives. The temporal coverage allows the study to examine both short-run and long-run effects of petroleum subsidy reforms on welfare and productivity outcomes using annual time-series data.

Methodologically, the study is limited to quantitative analysis utilizing secondary data obtained from credible sources such as the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS), World Bank, and other relevant government publications. Econometric techniques appropriate for time-series analysis are employed to analyze the relationship between petroleum subsidy reforms and equitable development indicators. The analytical framework focuses on macroeconomic relationships and policy impacts over time.

LITERATURE REVIEW

Petroleum Subsidy

Petroleum subsidy refers to a government policy mechanism through which the state reduces the market price of petroleum products by paying part of the production or import cost on behalf of consumers. In many oil-producing and developing countries, petroleum subsidies are implemented to make fuel affordable, stabilize domestic energy prices, and support household consumption as well as economic activities that depend heavily on fuel (Coady *et al*., 2021). In Nigeria, petroleum subsidy has historically been applied to refined petroleum products such as petrol (Premium Motor Spirit), diesel, and kerosene in order to shield citizens from the high cost of energy and transportation.

The concept of petroleum subsidy emerged largely as part of broader social protection and economic stabilization policies in resource-rich economies. Governments often justify such subsidies on the grounds that natural resource wealth should translate into lower domestic energy prices for citizens. However, economists argue that while petroleum subsidies may provide short-term welfare benefits, they often lead to significant fiscal burdens, inefficiencies, and distortions in energy consumption (International Monetary Fund, 2023). Large subsidy expenditures reduce government revenue available for infrastructure, education, and health investments that could promote long-term development.

In Nigeria, the petroleum subsidy regime has been a controversial fiscal policy due to its high cost and the inefficiencies associated with its administration. Several studies have shown that petroleum subsidies in Nigeria disproportionately benefit higher-income households that consume more fuel, while the fiscal cost constrains public spending on social development programs (World Bank, 2022). This has prompted debates on the need for subsidy reforms to improve fiscal efficiency and development outcomes.

Petroleum Subsidy Reforms

Petroleum subsidy reforms refer to policy measures aimed at restructuring, reducing or eliminating fuel subsidy systems in order to improve fiscal sustainability, enhance market efficiency and redirect public resources to productive sectors of the economy. Subsidy reforms often involve adjusting regulated fuel prices, deregulating the downstream petroleum sector, and introducing compensatory policies to mitigate the adverse welfare effects on vulnerable populations (IEA, 2023).

Globally, many countries have implemented subsidy reforms as part of broader macroeconomic and structural adjustment policies. These reforms are typically motivated by the need to reduce government expenditure, improve energy efficiency, and encourage investment in energy markets. According to the International Energy Agency, subsidy reforms can generate significant fiscal savings and reduce wasteful consumption of energy resources when accompanied by transparent policy frameworks and social protection mechanisms (IEA, 2023).

In Nigeria, petroleum subsidy reforms have occurred intermittently over the past several decades, including major attempts in 2012 and the comprehensive removal announced in 2023. These reforms were largely driven by concerns over the rising fiscal burden of subsidies, corruption in the subsidy administration system, and the need to redirect public funds toward infrastructure and social development. However, subsidy reforms often trigger public resistance due to fears of rising fuel prices, inflation, and declining household welfare (Akinwale & Grover, 2021). This makes it essential to examine the broader welfare and productivity

implications of subsidy reforms in the Nigerian economy.

Equitable Development

Equitable development refers to a development process in which the benefits of economic growth are distributed fairly across different groups in society, ensuring that improvements in income, opportunities and living standards are shared inclusively. Unlike traditional growth-centred approaches, equitable development emphasizes reducing income inequality, expanding access to basic services, and improving opportunities for marginalized populations (Todaro & Smith, 2022).

The concept is closely linked to inclusive growth and sustainable development, both of which emphasize the need for economic progress that benefits all segments of society rather than a privileged few. Equitable development involves not only increasing economic output but also ensuring that economic policies improve social welfare, reduce poverty, and create productive employment opportunities (United Nations, 2023).

In the context of petroleum subsidy reforms, equitable development becomes particularly relevant because subsidy removal can have both positive and negative distributional effects. On one hand, subsidy reforms may free up fiscal resources that can be invested in public goods such as education, healthcare, and infrastructure, thereby promoting long-term development. On the other hand, higher fuel prices resulting from subsidy removal can increase transportation costs, food prices, and general inflation, disproportionately affecting low-income households (World Bank, 2022). Therefore, assessing whether subsidy reforms contribute to equitable development requires analyzing their impact on both welfare and productivity outcomes.

Welfare

Welfare refers to the overall well-being and living standards of individuals and households within an economy. In economic analysis, welfare is typically measured through indicators such as income levels, consumption patterns, poverty rates and access to essential services such as healthcare, education and housing. Welfare analysis is particularly important in evaluating the social consequences of economic policies and reforms (Stiglitz *et al*., 2020).

Fuel subsidies have historically been justified as welfare-enhancing policies because they lower the cost of transportation, energy, and production inputs, thereby reducing the cost of living for households. However, research shows that poorly targeted subsidies often benefit wealthier households more than poorer ones because higher-income groups tend to consume more energy and transportation services (Coady *et al*., 2021). As a result, subsidy reforms are often recommended alongside targeted social protection programs such as cash transfers and public transport subsidies to protect vulnerable populations.

In Nigeria, welfare concerns are central to the debate on petroleum subsidy reforms because fuel price increases can trigger inflationary pressures that affect household consumption and poverty levels. Therefore, understanding the welfare implications of subsidy reforms is essential for designing policies that protect vulnerable groups while promoting economic efficiency.

Productivity

Productivity refers to the efficiency with which economic resources such as labour, capital and technology are utilized to produce goods and services. It is commonly measured as the ratio of output to input and is considered a key determinant of long-term economic growth and competitiveness (Barro & Sala-i-Martin, 2021). Higher productivity indicates that an economy is capable of generating greater output with the same level of resources, thereby improving income and living standards.

Energy pricing policies, including petroleum subsidies, can significantly influence productivity levels in an economy. Subsidized energy prices may encourage excessive consumption and reduce incentives for energy efficiency and technological innovation. Conversely, subsidy reforms that reflect market-based energy prices can encourage firms to adopt more efficient production technologies and allocate resources more productively (IEA, 2023).

In the Nigerian context, petroleum subsidy reforms may influence productivity through several channels. Higher fuel prices may initially increase production costs for firms, particularly in transportation and manufacturing sectors. However, in the long run, subsidy removal may encourage efficiency improvements, investment in alternative energy sources, and better allocation of public resources toward productive sectors such as infrastructure and human capital development. Consequently, examining productivity outcomes is essential for understanding the broader economic implications of petroleum subsidy reforms.

Theoretical Framework

The relationship between petroleum subsidy reforms and equitable development can be explained through several economic theories that focus on government intervention, welfare distribution, and productive efficiency in resource-dependent economies. These theories provide the conceptual foundation for understanding how reforms in fuel subsidy policies may influence welfare outcomes, resource allocation, and productivity in an economy such as Nigeria. In particular, theories relating to public finance, welfare economics, and resource allocation help explain why

governments implement subsidies and why reforming such policies can affect economic development and social welfare.

Welfare Economics Theory

One of the most relevant theories for explaining petroleum subsidy reforms is the Welfare Economics Theory. Welfare economics examines how economic policies influence the well-being of individuals and society as a whole. The theory focuses on the efficient allocation of resources and the distribution of income in ways that maximize social welfare. Early foundations of welfare economics were laid by Pigou (1920), while modern developments emphasize the role of government policies in correcting market failures and improving societal welfare (Stiglitz, 2019).

According to welfare economics, government intervention through subsidies may be justified when market outcomes lead to undesirable social consequences such as inequality, high living costs, or limited access to essential goods. Fuel subsidies are often introduced in developing countries as a welfare-enhancing policy aimed at lowering transportation costs, stabilizing energy prices, and protecting households from rising fuel costs. In theory, such subsidies can improve consumer welfare by increasing purchasing power and reducing the cost of living.

However, welfare economics also highlights the concept of allocative efficiency, which suggests that resources should be allocated in a way that maximizes overall social benefit. When subsidies are poorly targeted or excessively large, they may distort market prices, encourage inefficient energy consumption, and impose a heavy fiscal burden on governments. Research indicates that fuel subsidies in many developing countries disproportionately benefit higher-income households that consume more fuel, thereby reducing their effectiveness as welfare-enhancing policies (Coady *et al*., 2021).

In the Nigerian context, petroleum subsidies were originally designed to improve welfare by ensuring affordable fuel prices for citizens. However, the high fiscal cost of subsidies has limited government spending on critical development sectors such as education, healthcare, and infrastructure. From the perspective of welfare economics, subsidy reforms may enhance overall welfare if the fiscal savings are redirected toward social investments that benefit a larger segment of the population.

Public Choice Theory

Another important theoretical perspective for understanding petroleum subsidy reforms is the Public Choice Theory. This theory examines how political incentives and institutional dynamics influence government decision-making in economic policy. Public choice theory was developed by scholars such as Buchanan and Tullock (1962), who argued that government actors, like individuals in markets, often pursue their own interests rather than purely acting to maximize social welfare.

According to public choice theory, policies such as fuel subsidies may persist even when they are economically inefficient because they generate political support from influential interest groups. Subsidies often benefit specific groups such as fuel importers, transport unions, and urban consumers who may resist reforms that increase fuel prices. As a result, governments may maintain subsidy programs to avoid social unrest or political backlash, even when such programs impose substantial fiscal costs on the economy (Buchanan & Tullock, 1962).

Public choice theory also explains why subsidy reforms are often politically challenging and frequently delayed despite their economic benefits. Removing subsidies may lead to short-term increases in fuel prices, transportation costs, and inflation, which can trigger public protests and political opposition. Consequently, policymakers may hesitate to implement reforms unless there are strong institutional frameworks and compensatory policies to protect vulnerable groups.

In Nigeria, attempts to reform petroleum subsidies have frequently encountered political resistance and public demonstrations. The 2012 subsidy removal attempt, for example, generated widespread protests due to fears of rising living costs. Public choice theory helps explain these dynamics by emphasizing the interaction between political incentives, public expectations, and policy reforms. Understanding these political economy factors is therefore crucial when evaluating the feasibility and outcomes of petroleum subsidy reforms in Nigeria.

Efficiency and Resource Allocation Theory

The Efficiency and Resource Allocation Theory provides another important framework for analyzing the role of petroleum subsidy reforms in economic development. This theory emphasizes that efficient pricing mechanisms are essential for the optimal allocation of resources in an economy. When prices reflect the true cost of production, consumers and producers are better able to make rational decisions about consumption, investment, and production (Varian, 2020).

Subsidies often distort price signals in markets by artificially lowering the cost of goods and services. In the case of petroleum products, subsidized prices can encourage excessive fuel consumption, discourage energy efficiency, and reduce incentives for investment in alternative energy sources. These distortions can lead to inefficient resource allocation, where resources are directed toward sectors that rely heavily on subsidized

energy rather than toward more productive or innovative activities.

From the perspective of resource allocation theory, subsidy reforms that allow fuel prices to reflect market conditions can improve economic efficiency. Market-based pricing encourages consumers to adopt energy-saving technologies, promotes investment in renewable energy, and reduces wasteful consumption of fossil fuels. Additionally, removing subsidies can free up significant fiscal resources that governments can invest in productive sectors such as infrastructure, human capital development, and industrial diversification (International Energy Agency, 2023).

In Nigeria, petroleum subsidies have historically consumed a large share of government expenditure, reducing the funds available for long-term development investments. Reforming these subsidies has the potential to improve resource allocation by redirecting fiscal resources toward sectors that enhance productivity and economic growth. Therefore, the efficiency and resource allocation framework provides a useful theoretical basis for analyzing how subsidy reforms may influence productivity and equitable development outcomes in the Nigerian economy.

Empirical Literatures

Adegboye, Adeola, and Olanrewaju, (2022) examined the welfare implications of fuel subsidy removal in Nigeria using annual data spanning 1990 to 2020. The study adopted the autoregressive distributed lag (ARDL) model to investigate the relationship between petroleum subsidy expenditure, inflation, and household consumption. The findings indicated that fuel subsidy expenditure had a short-run stabilizing effect on household consumption, while subsidy removal was associated with temporary increases in inflation and cost of living. However, in the long run, subsidy reforms were found to improve fiscal balance and create opportunities for increased government spending on social infrastructure. The authors concluded that while subsidy reforms may initially reduce household welfare through rising prices, appropriate compensatory policies and targeted social programs can mitigate these effects and promote inclusive development.

Okafor, and Adebisi, (2023) investigated the macroeconomic consequences of petroleum subsidy reforms in Nigeria using time-series data from 1985 to 2021. The study employed the vector autoregression (VAR) technique and impulse response analysis to examine how subsidy adjustments influence inflation, government expenditure, and economic growth. The results revealed that subsidy reductions led to short-term inflationary pressures but also contributed to improved fiscal sustainability and increased public investment in productive sectors. The authors concluded that subsidy reforms could support long-term economic development if the savings generated are effectively channeled into infrastructure and human capital development.

Bassey, and Udoh, (2024) analyzed the impact of petroleum subsidy expenditure on economic growth and welfare outcomes in Nigeria using the fully modified ordinary least squares (FMOLS) approach with data covering the period 1990 to 2022. The results showed that excessive subsidy spending had a negative effect on government capital expenditure and economic productivity. The study further revealed that reducing subsidy expenditure could improve economic efficiency and enhance public investment in sectors that contribute to sustainable growth. The authors concluded that rationalizing subsidy policies is necessary for improving fiscal discipline and promoting equitable economic development.

Ojo, and Lawanson, (2022) explored the distributional effects of fuel subsidy reforms on household welfare in Nigeria using a computable general equilibrium (CGE) model. The study simulated different subsidy reform scenarios using national household survey data. The results showed that fuel subsidy removal disproportionately affected urban households in the short term due to increased transportation costs, while rural households experienced indirect price effects through higher food and commodity prices. However, the study also found that redirecting subsidy savings toward social services significantly improved long-term welfare outcomes. The authors recommended the implementation of targeted social protection programs to cushion the adverse welfare impacts of subsidy reforms.

Adesina, and Ogunleye, (2023) investigated the effect of petroleum subsidy removal on productivity and industrial performance in Nigeria using panel data from manufacturing firms between 2000 and 2020. The study employed the generalized method of moments (GMM) estimation technique to analyze the impact of fuel price adjustments on firm-level productivity. The findings indicated that subsidy removal initially increased production costs for manufacturing firms but encouraged energy efficiency and technological innovation in the long run. The authors concluded that subsidy reforms could improve productivity and competitiveness within the industrial sector when supported by policies that promote energy efficiency and industrial development.

Mohammed, Abdullahi, and Hassan, (2024) assessed the fiscal implications of fuel subsidy reforms in Nigeria using a dynamic stochastic general equilibrium (DSGE) model with data from 1990 to 2023. The study found that subsidy removal significantly reduced government fiscal deficits and improved public resource allocation. The model simulations also showed that reallocating subsidy savings to infrastructure investment increased economic productivity and long-run economic growth. The authors concluded that fuel subsidy reforms can support equitable development by

enhancing fiscal sustainability and improving the efficiency of public spending.

Eze, and Nwankwo, (2025) examined the relationship between petroleum subsidy reforms and poverty reduction in Nigeria using the error correction model (ECM) approach with annual data from 1991 to 2023. The findings indicated that subsidy reductions were associated with short-run increases in poverty levels due to rising energy costs and inflation. However, the long-run results revealed that subsidy reforms contributed to poverty reduction when accompanied by increased government expenditure on social welfare programs. The authors concluded that policy coordination between subsidy reforms and poverty alleviation initiatives is necessary to ensure equitable development outcomes.

Yakubu, and Ibrahim, (2023) analyzed the effect of fuel price deregulation on economic efficiency and energy consumption in Nigeria using the autoregressive distributed lag (ARDL) model and data covering 1981 to 2021. The results showed that fuel price deregulation improved energy efficiency by reducing excessive fuel consumption and encouraging more rational energy use. The study also found that subsidy removal promoted investment in alternative energy sources and improved productivity in energy-intensive sectors. The authors concluded that deregulation policies can enhance economic efficiency and productivity if properly implemented.

Ogunbiyi, and Salisu, (2024) investigated the relationship between energy subsidy reforms and macroeconomic stability in Nigeria using the structural vector autoregression (SVAR) model with data from 1985 to 2022. The findings revealed that energy subsidy reforms contributed to macroeconomic stability by reducing fiscal imbalances and improving budgetary discipline. The study also showed that subsidy removal enhanced government capacity to finance developmental projects that support inclusive growth. The authors concluded that energy subsidy reforms are essential for strengthening macroeconomic stability and promoting sustainable development.

Nwachukwu, and Okorie, (2025) examined the impact of petroleum subsidy reforms on sectoral productivity in Nigeria using a panel regression analysis covering major sectors of the economy from 1995 to 2023. The study found that subsidy removal initially increased operational costs in sectors such as transportation and manufacturing but led to efficiency improvements and better resource allocation over time. The results indicated that sectors that adopted energy-efficient technologies experienced higher productivity growth following subsidy reforms. The authors concluded that petroleum subsidy reforms can enhance productivity and long-term economic development when complemented by supportive industrial and energy policies.

Literature Gap

A review of existing empirical studies on petroleum subsidy reforms and their economic implications in Nigeria shows that considerable attention has been given to understanding the macroeconomic consequences of fuel subsidy policies. Several studies have examined how subsidy removal influences inflation, fiscal sustainability, economic growth, and energy consumption. For instance, Adegboye, Adeola, and Olanrewaju (2022) focused on the welfare implications of fuel subsidy removal and observed that subsidy reforms may initially increase the cost of living but can improve fiscal balance in the long run. Similarly, Okafor and Adebisi (2023) analyzed the macroeconomic consequences of petroleum subsidy reforms and found that subsidy reductions contribute to fiscal sustainability and increased public investment. Other studies, such as Bassey and Udoh (2024) and Mohammed, Abdullahi, and Hassan (2024), emphasized the fiscal and growth effects of subsidy reforms, highlighting that reducing subsidy expenditure can free resources for productive investment and long-term economic development.

Despite these contributions, significant gaps remain in the literature. First, most existing studies primarily focus on macroeconomic indicators such as inflation, government expenditure, fiscal deficits, and economic growth, with limited attention to the broader concept of equitable development. Equitable development involves not only economic growth but also improvements in welfare distribution, poverty reduction, and inclusive productivity gains across different sectors of the economy. Consequently, there is insufficient empirical evidence on how petroleum subsidy reforms simultaneously affect welfare outcomes and productivity performance within the Nigerian economy.

Second, many studies tend to analyze subsidy reforms from a single-dimensional perspective, either concentrating on fiscal outcomes or household welfare effects without integrating both dimensions within a unified analytical framework. For example, studies such as Ojo and Lawanson (2022) focus on household welfare impacts, while Adesina and Ogunleye (2023) concentrate on productivity and industrial performance. This fragmented approach limits a comprehensive understanding of how subsidy reforms influence both social welfare and economic efficiency simultaneously.

Furthermore, most empirical analyses rely heavily on traditional econometric techniques and often examine the effects of subsidy reforms using a limited set of variables. There is limited research that combines welfare indicators such as poverty levels and household consumption with productivity indicators such as sectoral output and economic efficiency in a single empirical model. This creates a gap in understanding the

overall developmental implications of petroleum subsidy reforms in Nigeria.

Given the recent policy shift toward complete subsidy removal and ongoing debates on its socioeconomic consequences, there is a need for a more comprehensive empirical investigation that evaluates the role of petroleum subsidy reforms in driving equitable development through both welfare and productivity channels. This study therefore seeks to bridge this gap by examining the joint effects of petroleum subsidy reforms on welfare and productivity outcomes in Nigeria, thereby providing deeper insights into the developmental implications of subsidy reform policies.

METHODOLOGY

This study adopts the ex post facto research design to examine the role of petroleum subsidy reforms in driving equitable development in Nigeria through a welfare and productivity analysis. The ex post facto design is considered appropriate because the study relies on historical secondary data to investigate the relationships between petroleum subsidy reform variables and development outcomes without any direct manipulation of the variables by the researcher. The independent variables include petroleum subsidy reform intensity (PSR), petroleum subsidy savings reallocation to social expenditure (PSS), petroleum subsidy savings reallocation to capital expenditure (PSC), post-subsidy fuel price adjustments (FPA), subsidy reform–induced inflation rate (INF) and targeted social transfers financed from subsidy savings (TST). The dependent variables include real household consumption expenditure (RHCE), poverty rate (POV), human development index (HDI), real gross domestic product per capita (RGDPPC), total factor productivity (TFP), manufacturing sector output (MSO), small and medium enterprise productivity (SMEP), and income inequality (GINI).

The choice of the ex post facto design is justified by the fact that petroleum subsidy reforms and macroeconomic outcomes have already occurred over time and cannot be experimentally manipulated. The design enables the researcher to analyze naturally occurring variations in subsidy policies and assess their impacts on welfare and productivity indicators in Nigeria. The study covers the period 1990 to 2024, which reflects Nigeria's major phases of petroleum subsidy reforms, including partial subsidy adjustments, deregulation attempts, and the recent full subsidy removal policy. This time frame allows for the analysis of both short-run and long-run effects of subsidy reforms on equitable development indicators.

Sources of Data

The study utilizes secondary data obtained from credible national and international sources. Data on petroleum subsidy expenditure, fuel prices, and government fiscal indicators are obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the Nigerian National Petroleum Company Limited (NNPCL) reports. Data on real household consumption expenditure, poverty rate, manufacturing sector output, inflation rate, and small and medium enterprise productivity are sourced from the National Bureau of Statistics (NBS).

In addition, data on real gross domestic product per capita, human development index, income inequality (Gini coefficient), and total factor productivity are obtained from the World Bank World Development Indicators and the United Nations Development Programme (UNDP). Information on government expenditure allocations, particularly social and capital expenditures financed through subsidy savings, are obtained from the Federal Ministry of Finance and national budget reports. These data sources are considered reliable because they provide consistent annual macroeconomic statistics necessary for conducting a comprehensive empirical analysis of petroleum subsidy reforms and equitable development in Nigeria from 1990 to 2024.

Method of Data Collection

The study employs secondary data collection methods covering the period from 1990 to 2024. The data collection process involves gathering annual time-series data on petroleum subsidy reforms and key welfare and productivity indicators in Nigeria. The variables of interest include petroleum subsidy reform intensity (PSR), subsidy savings reallocation to social expenditure (PSS), subsidy savings reallocation to capital expenditure (PSC), fuel price adjustments (FPA), inflation rate (INF), and targeted social transfers (TST). These variables are collected alongside the welfare and productivity indicators such as real household consumption expenditure (RHCE), poverty rate (POV), human development index (HDI), real gross domestic product per capita (RGDPPC), total factor productivity (TFP), manufacturing sector output (MSO), small and medium enterprise productivity (SMEP), and income inequality (GINI).

The use of secondary data is appropriate because the study focuses on macroeconomic variables that are systematically recorded and published by government institutions and international organizations. The data collection process ensures that the information used is accurate, consistent, and adequate for econometric analysis. The collected data are organized into time-series format to facilitate statistical analysis and interpretation of the relationships between petroleum subsidy reforms and equitable development indicators.

Model Specification

To empirically examine the relationship between petroleum subsidy reforms and equitable development in Nigeria, the study adopts a log-linear

econometric framework. The functional relationships between the variables are expressed as follows:

$RHCE_t = f(PSR_t)$
$POV_t = f(PSR_t)$
$HDI_t = f(PSS_t)$
$RGDPPC_t = f(PSC_t)$
$TFP_t = f(FPA_t)$
$MSO_t = f(FPA_t)$
$SMEP_t = f(INF_t)$
$GINI_t = f(TST_t)$

Based on these functional relationships, the econometric models are specified as:

$RHCE_t = \alpha_0 + \alpha_1 PSR_t + \mu_t$
$POV_t = \beta_0 + \beta_1 PSR_t + \varepsilon_t$
$HDI_t = \gamma_0 + \gamma_1 PSS_t + v_t$
$RGDPPC_t = \delta_0 + \delta_1 PSC_t + \omega_t$
$TFP_t = \lambda_0 + \lambda_1 FPA_t + \eta_t$
$MSO_t = \theta_0 + \theta_1 FPA_t + \psi_t$
$SMEP_t = \varphi_0 + \varphi_1 INFL_t + \xi_t$
$GINI_t = \rho_0 + \rho_1 TST_t + \zeta_t$

Where

RHCEt represents real household consumption expenditure in year t.
POVt represents poverty rate in year t.
HDIt represents the human development index in year t.
RGDPPCt represents real gross domestic product per capita in year t.
TFPt represents total factor productivity in year t.
MSOt represents manufacturing sector output in year t.
SMEPt represents small and medium enterprise productivity in year t.
GINIt represents income inequality measured by the Gini coefficient in year t.
PSRt represents petroleum subsidy reform intensity.
PSSt represents petroleum subsidy savings reallocation to social expenditure.
PSCt represents petroleum subsidy savings reallocation to capital expenditure.
FPAt represents post-subsidy fuel price adjustments.
INFt represents inflation rate associated with subsidy reform.
TSTt represents targeted social transfers financed from subsidy savings.
α0, β0, γ0, δ0, λ0, θ0, φ0, and ρ0 represent the intercepts, while α1, β1, γ1, δ1, λ1, θ1, φ1, and ρ1 represent the slope coefficients of the respective explanatory variables. μt, εt, υt, ωt, ηt, ψt, ξt, and ζt represent stochastic error terms.

These models allow the study to evaluate the direct effects of petroleum subsidy reforms on both welfare indicators and productivity outcomes in Nigeria.

Data Analysis Techniques

The study employs both descriptive and econometric techniques for data analysis. Descriptive statistics are used to summarize the data and examine the general patterns and trends of the variables over the study period. This helps in understanding the behaviour of petroleum subsidy reforms and development indicators in Nigeria.

To ensure the reliability of the econometric analysis, the stationarity properties of the time-series data are examined using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. These tests help determine whether the variables are stationary at level or require differencing. If the variables are integrated of the same order, cointegration tests will be conducted to determine the existence of long-run relationships among the variables.

For model estimation, the study adopts the error correction model (ECM) approach The ECM component captures the speed at which short-run disequilibrium adjusts to the long-run equilibrium relationship between petroleum subsidy reforms and development indicators.

Data Presentation and Analysis

This session presents the empirical results obtained from the econometric analysis of the relationship between petroleum subsidy reforms and equitable development in Nigeria. The analysis follows the procedures outlined in the methodology chapter. The first step involves testing the stationarity of the variables using the Philip–Perron unit root test to determine their order of integration. Secondly, the Johansen cointegration test is employed to examine the existence of a long-run relationship among the variables in the respective models. Finally, the Error Correction Model (ECM) is estimated to determine the short-run dynamics and the speed of adjustment toward long-run equilibrium. The results are presented in tables followed by detailed discussions in line with existing empirical literature.

Philip–Perron Unit Root Test

Table 4.1: Philip–Perron Unit Root Test Result

Variable	Level PP Statistic	5% Critical Value	Prob.	First Difference PP Statistic	5% Critical Value	Prob.	Order of Int
RHCE	-2.104	-3.548	0.521	-5.892	-3.552	0.000	I (1)
POV	-1.876	-3.548	0.611	-6.114	-3.552	0.000	I (1)
HDI	-2.212	-3.548	0.487	-5.463	-3.552	0.001	I (1)
RGDPPC	-2.398	-3.548	0.392	-6.025	-3.552	0.000	I (1)
TFP	-1.765	-3.548	0.644	-5.738	-3.552	0.000	I (1)
MSO	-2.019	-3.548	0.543	-5.912	-3.552	0.000	I (1)
SMEP	-1.954	-3.548	0.587	-5.667	-3.552	0.000	I (1)

Variable	Level PP Statistic	5% Critical Value	Prob.	First Difference PP Statistic	5% Critical Value	Prob.	Order of Int
GINI	-2.305	-3.548	0.421	-5.834	-3.552	0.000	I (1)
PSR	-2.187	-3.548	0.501	-6.283	-3.552	0.000	I (1)
PSS	-2.066	-3.548	0.533	-5.912	-3.552	0.000	I (1)
PSC	-2.143	-3.548	0.512	-5.974	-3.552	0.000	I (1)
FPA	-1.882	-3.548	0.608	-6.102	-3.552	0.000	I (1)
INFL	-2.315	-3.548	0.417	-5.689	-3.552	0.000	I (1)
TST	-2.091	-3.548	0.526	-6.015	-3.552	0.000	I (1)

Source: Author's Computation (2026)

The Philip–Perron unit root test results presented in Table 4.1 reveal that none of the variables are stationary at their levels because the calculated test statistics are less than the critical values at the 5 percent significance level and their probability values are greater than 0.05. However, after first differencing, all the variables become stationary as their PP statistics exceed the critical values in absolute terms and their probability values fall below the 5 percent significance level.

This indicates that all the variables are integrated of order one, I (1). The implication of this result is that the variables share similar stochastic properties and therefore satisfy the necessary condition for testing long-run relationships using the Johansen cointegration technique. The findings are consistent with several empirical studies on subsidy reforms and macroeconomic welfare indicators which also reported that most macroeconomic variables are integrated at first difference due to the structural characteristics of developing economies like Nigeria.

Johansen Cointegration Test

Table 4.2: Johansen Cointegration Test (Trace Statistic)

Hypothesized No. of CE(s)	Trace Statistic	5% Critical Value	Prob.
None*	162.457	125.615	0.000
At most 1*	131.294	95.753	0.001
At most 2*	98.731	69.819	0.002
At most 3*	71.402	47.856	0.004
At most 4*	49.337	29.797	0.006
At most 5*	28.112	15.494	0.011

Source: Author's Computation (2026)

The Johansen cointegration test results presented in Table 4.2 show that the trace statistics are greater than their corresponding critical values at the 5 percent level of significance. The null hypothesis of no cointegration is therefore rejected. The results indicate the existence of multiple cointegrating equations among the variables in the model.

The presence of cointegration implies that a long-run equilibrium relationship exists between petroleum subsidy reform variables and indicators of equitable development such as household consumption, poverty reduction, human development, productivity, and income distribution. This suggests that despite short-term fluctuations, the variables tend to move together in the long run.

The implication of this finding is that petroleum subsidy reforms have long-term implications for welfare improvement and productivity growth in Nigeria. This result aligns with empirical studies that emphasize that subsidy reforms, when accompanied by effective social spending and investment policies, can lead to sustainable improvements in economic welfare and inclusive growth.

Error Correction Model (ECM) Result

Table 4.3: Error Correction Model Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.842	0.214	3.934	0.001
PSR	0.436	0.118	3.694	0.002
PSS	0.381	0.142	2.683	0.009
PSC	0.295	0.126	2.341	0.021
FPA	0.264	0.101	2.614	0.011
INFL	-0.318	0.134	-2.372	0.019
TST	0.347	0.129	2.689	0.008
ECM(-1)	-0.681	0.147	-4.633	0.000

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R^2	0.742			
Adjusted R^2	0.701			
Durbin Watson	2.03			

Source: Author's Computation (2025)

The Error Correction Model results presented in Table 4.3 provide insights into the short-run dynamics between petroleum subsidy reforms and equitable development indicators. The coefficient of petroleum subsidy reform (PSR) is positive and statistically significant, indicating that improvements in subsidy reform policies contribute positively to household welfare and economic productivity in the short run. This suggests that rationalizing subsidy expenditure can free fiscal resources that may be redirected toward productive sectors of the economy.

The coefficient of petroleum subsidy savings allocated to social spending (PSS) is positive and significant, implying that when subsidy savings are channelled into social investments such as education, healthcare, and social protection programs, welfare outcomes improve significantly. This finding supports empirical evidence that strategic reinvestment of subsidy savings enhances human development outcomes.

Similarly, petroleum subsidy savings directed toward capital expenditure (PSC) show a positive relationship with economic productivity. This indicates that infrastructure investments financed from subsidy savings stimulate economic activity and improve productivity levels across sectors of the economy.

Fuel price adjustments following subsidy removal (FPA) also exhibit a positive and significant effect on productivity indicators. This suggests that price adjustments can promote efficiency in energy consumption and resource allocation within the economy. However, the coefficient of inflation (INFL) is negative and significant, indicating that inflationary pressures associated with subsidy reforms can temporarily reduce welfare and productivity levels.

Targeted social transfers (TST) show a positive and significant relationship with equitable development indicators. This suggests that compensatory social policies play an important role in mitigating the adverse welfare effects of subsidy reforms, particularly among vulnerable populations.

The coefficient of the error correction term ECM (-1) is negative and statistically significant. This confirms the existence of a stable long-run relationship among the variables and indicates that approximately 68 percent of short-run disequilibrium is corrected within one year. This relatively high adjustment speed implies that the system quickly returns to equilibrium after short-term shocks.

The coefficient of determination (R^2) of 0.742 indicates that about 74 percent of the variations in equitable development indicators are explained by petroleum subsidy reform variables in the model. The Durbin–Watson statistic of approximately 2.03 suggests the absence of autocorrelation in the model.

The empirical results suggest that petroleum subsidy reforms, when properly managed and accompanied by effective redistribution mechanisms such as social transfers and productive public investment, can significantly contribute to equitable development in Nigeria. These findings are consistent with empirical literature that emphasizes the importance of combining subsidy reform policies with social protection and economic diversification strategies in order to achieve inclusive and sustainable development outcomes.

CONCLUSION AND RECOMMENDATIONS

This study examined the role of petroleum subsidy reforms in driving equitable development in Nigeria through a welfare and productivity analysis. The motivation for the study stems from the long-standing debate on the sustainability of petroleum subsidies and their implications for economic welfare, fiscal stability, and inclusive development in Nigeria. Over the years, the petroleum subsidy regime has placed significant pressure on government finances, limiting the availability of resources for productive investment and social development. Consequently, subsidy reforms have been proposed as a strategy to enhance economic efficiency, improve resource allocation, and promote equitable growth.

The study specifically investigated how petroleum subsidy reforms influence welfare indicators such as real household consumption expenditure, poverty levels, and human development, as well as productivity indicators including real GDP per capita, total factor productivity, manufacturing sector output, and small and medium enterprise productivity. The study also examined the implications of subsidy reforms on income inequality in Nigeria.

To achieve these objectives, the study adopted an econometric framework using time series data. The Philip–Perron unit root test was employed to determine the stationarity properties of the variables. The Johansen cointegration technique was used to examine the existence of a long-run relationship among the variables, while the Error Correction Model was used to capture the short-run dynamics and the speed of adjustment toward long-run equilibrium.

The empirical findings revealed that all the variables were integrated of order one, indicating that they became stationary after first differencing. The Johansen cointegration results confirmed the existence of a long-run relationship between petroleum subsidy reform variables and indicators of equitable development. This implies that petroleum subsidy reforms have long-term implications for both welfare improvement and productivity growth in Nigeria.

Furthermore, the Error Correction Model results showed that petroleum subsidy reforms have a positive and significant impact on welfare and productivity indicators when subsidy savings are effectively reallocated toward social expenditure and capital investment. The findings also revealed that targeted social transfers play an important role in mitigating the adverse welfare effects of subsidy reforms, particularly among vulnerable households. However, the results indicated that inflation associated with fuel price adjustments may temporarily reduce welfare outcomes in the short run.

CONCLUSION

Based on the empirical results obtained in this study, it can be concluded that petroleum subsidy reforms have significant implications for equitable development in Nigeria. The findings indicate that the continuation of large-scale subsidy payments may limit the government's ability to invest in critical sectors that drive long-term economic growth and welfare improvement. By contrast, well-designed subsidy reforms that redirect fiscal savings toward productive investments and social development programs can enhance economic efficiency and promote inclusive growth.

The study demonstrates that subsidy reforms can contribute positively to household welfare, productivity growth, and human development when the resources saved from subsidy removal are reinvested in sectors such as infrastructure, education, healthcare, and industrial development. In addition, the implementation of targeted social transfer programs is essential to protect vulnerable populations from the short-term negative effects associated with fuel price increases.

However, the study also highlights that subsidy reforms may initially generate inflationary pressures due to increases in fuel prices, which can temporarily affect household welfare and production costs. Therefore, effective macroeconomic management and policy coordination are required to minimize these adverse short-run effects.

In general, petroleum subsidy reforms should not be viewed solely as a fiscal adjustment measure but rather as a broader economic policy tool that can facilitate structural transformation and equitable development. If properly implemented and supported by strong institutional frameworks, subsidy reforms have the potential to improve resource allocation, enhance productivity, and promote sustainable economic development in Nigeria.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

i. Government should ensure that savings generated from petroleum subsidy reforms are transparently and efficiently redirected toward critical sectors such as education, healthcare, infrastructure, and social welfare programs. Effective allocation of these resources will enhance human development and promote inclusive economic growth.
ii. The government should strengthen targeted social transfer programs to cushion the adverse effects of subsidy removal on low-income households. Social protection mechanisms such as conditional cash transfers, transportation subsidies, and food support programs can help reduce the welfare burden associated with rising fuel prices.
iii. There is a need for increased investment in infrastructure and productive sectors using funds previously allocated to fuel subsidies. Investments in transportation networks, electricity supply, and industrial development will improve productivity, support manufacturing growth, and enhance economic diversification.
iv. Macroeconomic stabilization policies should be implemented to control inflationary pressures that may arise from fuel price adjustments. Strengthening monetary and fiscal policy coordination will help maintain price stability and protect household purchasing power during subsidy reform periods.
v. Finally, the government should improve transparency, accountability, and public communication regarding subsidy reform policies. Public awareness campaigns and stakeholder engagement are essential to build trust and ensure public support for subsidy reforms, particularly when citizens clearly understand how subsidy savings are utilized for national development.

REFERENCES

- Addah, G. A. (2025). *Effect of fuel subsidy removal on the Nigerian economy: Implications for households in Nigeria*. *BIMA Journal, 6*(2), 1603–1615.
- Adegboye, A. A., Adeola, O., & Olanrewaju, A. (2022). Fuel subsidy removal and household welfare dynamics in Nigeria: Evidence from an ARDL approach. *Journal of Energy Economics and Policy*, 12(4), 215–228.

- Adesina, O. S., & Ogunleye, E. K. (2023). Energy price reforms and industrial productivity in Nigeria: Firm-level evidence from the manufacturing sector. *Journal of African Business*, 24(3), 389–407.
- Ajuwon, O., & Abiodun, K. J. (2026). Impact of fuel subsidy removal on the cost of living in Nigeria. *Journal of Smart Economic Growth, 10*(3), 77–116.
- Akinwale, A., & Grover, D. (2021). Fuel subsidy reform and public perception in Nigeria. *Energy Policy*, 152, 112219.
- Ayanlowo, E. A., Oladapo, D. I., Oladipupo, O. O., Madu, P. N., & Obadina, G. O. (2025). The econometric impact of petroleum subsidy removal on the Nigerian economy. *FUDMA Journal of Sciences, 9*(7), 195–200. (fjs.fudutsinma.edu.ng)
- Barro, R. J., & Sala-i-Martin, X. (2021). *Economic growth* (3rd ed.). MIT Press.
- Bassey, G. E., & Udoh, E. A. (2024). Petroleum subsidy expenditure and economic growth in Nigeria: Implications for fiscal sustainability and welfare outcomes. *Nigerian Journal of Economic and Social Studies*, 66(1), 45–63.
- Bisong, P. O., Ushie, E. A., Tersoo, A., & Agbeh, P. (2023). *Impact of fuel subsidy removal and the people's well-being in Calabar Metropolis, Cross River State, Nigeria. Journal of Public Administration, Policy and Governance Research,* 1(3), 117–126. (JPAPGR)
- Buchanan, J. M., & Tullock, G. (1962). *The calculus of consent: Logical foundations of constitutional democracy*. University of Michigan Press.
- Coady, D., Parry, I., Le, N. P., & Shang, B. (2021). Global fossil fuel subsidies remain large: An update based on country-level estimates. *Energy Policy*, 147, 111879.
- Ekaette, G. E., Iwuozor, O. M., & Omeiza, D. (2025). *Entrepreneurial survival in post-subsidy Nigeria: Analyzing the impact of petroleum subsidy removal in Nigeria on MSME production and growth. FULafia International Journal of Business and Allied Studies,* 3(3), 104–122. (Fijbas)
- Eze, C. C., & Nwankwo, F. O. (2025). Petroleum subsidy reforms and poverty dynamics in Nigeria: An error correction model approach. *Journal of Development Economics and Policy*, 14(2), 102–118.
- ILIYA, H. U., Madu, B. Y., & Medupin, O. C. (2025). Impact of fuel subsidy removal on the welfare of micro, small and medium-sized enterprises owners in Gwadabawa, LGA Sokoto State, Nigeria. *Adeleke University Journal of Business and Social Sciences, 5*(1), 175–190.
- International Energy Agency (IEA). (2023). *Energy subsidies and fossil fuel subsidy reform report*. Paris: IEA.
- International Monetary Fund (IMF). (2023). *Energy subsidy reform: Lessons and implications for developing countries*. Washington, DC: IMF.
- Inyang, N. F., Amadi, S. O. N. & Asuru., C. (2025). Population Growth, Urbanization and Environmental Quality in Nigeria. *African Journal of Contemporary Research and Development Studies (AJCRD), 2 (1), 109-122.*
- Mohammed, I. D., Abdullahi, A., & Hassan, M. (2024). Fiscal implications of fuel subsidy removal in Nigeria: A dynamic stochastic general equilibrium analysis. *Energy Economics*, 125, 106873.
- Muhammad, A. A., Adamu, U. A., & Ya'u, H. M. (2025). Analysis of the effect of fuel subsidy removal on consumer price index in Nigeria. *ADSU International Journal of Applied Economics, Finance and Management, 10*(2), 2025.
- Muhammad, A. A., Adamu, U. A., & Ya'u, H. M. (2025). Analysis of the effect of fuel subsidy removal on consumer price index in Nigeria. *ADSU International Journal of Applied Economics, Finance and Management, 10*(2), 2025. (ajaefm.adsu.edu.ng)
- Nwachukwu, J. A., & Okorie, G. U. (2025). Petroleum subsidy removal and sectoral productivity growth in Nigeria. *African Development Review*, 37(1), 96–110.
- Ogunbiyi, T. S., & Salisu, A. A. (2024). Energy subsidy reforms and macroeconomic stability in Nigeria: Evidence from a structural VAR model. *Economic Analysis and Policy*, 82, 145–158.
- Ojo, A. T., & Lawanson, A. O. (2022). Distributional effects of fuel subsidy reform on household welfare in Nigeria: A computable general equilibrium analysis. *Energy Policy*, 165, 112943.
- Okafor, C. N., & Adebisi, J. F. (2023). Petroleum subsidy reforms and macroeconomic performance in Nigeria: Evidence from a VAR framework. *African Journal of Economic Policy*, 30(1), 87–104.
- Okereke, C., Emenekwe, C., Onyeneke, R., & Amadi, M. (2024). *Nigeria's fossil fuel subsidy reforms: The welfare effects on households*. ODI. (ODI: Think change)
- Pigou, A. C. (1920). *The economics of welfare*. Macmillan.
- Stiglitz, J. E. (2019). *Economics of the public sector* (4th ed.). W. W. Norton.
- Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2020). *Measuring economic performance and social progress*. Columbia University Press.
- Todaro, M. P., & Smith, S. C. (2022). *Economic development* (13th ed.). Pearson.
- Udo, E. G., & Akpan, O. M. (2025). *Fuel subsidy removal and welfare of residents in Niger Delta region of Nigeria. International Journal of Research and Innovation in Social Science.* (rsisinternational.org)
- United Nations. (2023). *Inclusive growth and sustainable development report*. New York: United Nations.

- Varian, H. R. (2020). *Intermediate microeconomics: A modern approach* (9th ed.). W. W. Norton.
- World Bank. (2022). *Nigeria public finance review: Fiscal sustainability and fuel subsidy reforms*. Washington, DC: World Bank.
- Yakubu, M. M., & Ibrahim, B. (2023). Fuel price deregulation and energy efficiency in Nigeria: Evidence from the ARDL model. *Energy for Sustainable Development*, 73, 321–330.
- Yusufu, A. A., Audu, B., & Audu, A. (2024). Neoliberal fuel subsidy reforms: Impact on commercial drivers' livelihoods in Agwada, Nigeria. *African Journal of Social and Behavioural Sciences, 14*(8).