



Impact of Fuel Subsidy Removal on Gross Domestic Product and Transportation Cost in Nigeria

Olusegun Onifade Adepoju (Ph.D) 

*Department of Transport and Logistics, Faculty of Arts, Management and Social Sciences, Nigerian Army University,
P.M.B 1500 Biu, Borno State*

Afolabi Quadri Balogun 

*Department of Economics, Faculty of Arts, Management and Social Sciences, Nigerian Army University,
P.M.B 1500 Biu, Borno State*

Ogola Daniel Beksuomowe 

Department of Port Management, Nigerian Maritime University, Okerenkoko, Delta State, Nigeria

Suggested Citation

Adepoju, O.O., Balogun, A.Q. & Beksuomowe, O.D. (2023).
Impact of Fuel Subsidy Removal
on Gross Domestic Product and
Transportation Cost in Nigeria.
*European Journal of Theoretical and
Applied Sciences*, 1(5), 769-777.
DOI: [10.59324/ejtas.2023.1\(5\).63](https://doi.org/10.59324/ejtas.2023.1(5).63)

Abstract:

This study identified economic problem arising from transportation cost due to removal of fuel subsidy in Nigeria. We therefore decided to collect secondary data from Statista, World Bank web link and prices of Premium Motor Spirit (PMS) from 2011-2023. Data on the three variables i.e GDP, the price of PMS and inflation rate were correlated to determine their level of relationships. Pearson Product Moment Correlation Coefficient was used to analyse the secondary data with the aid of SPSS software. The result from the analysis indicated that, inflation increased by 64% with increased fuel price decreasing GDP by 42.5%. Inflation is witnessed to have increased

and GDP decreases. It can be seen that fuel is very critical to the development of Nigeria. It has a direct effect on GDP and surprisingly price inflation has impact on Nigerians. Solving one problem perhaps of fuel has a significant effect on economy. There are two things that should be done as alternatives to subsidy removal; the first is to make the supply of fuel more than the demand. The second option is to find alternative fuel like other countries because the demand for crude oil as major revenue may dwindle over time if the buyers who are planning vigorously on alternative fuel are able to do away with our crude oil. The use of electric vehicle, solar powered vehicles, hybrid vehicles and policy that will encourage non-motorized transport can assist Nigeria to forestall future challenges of global oil demand.

Keywords: *Fuel, Transportation, GDP, Nigeria, Subsidy.*

Introduction

The motivation for this study stemmed from the current inflation as a result of fuel subsidy removal and Dollar-Naira exchange rates that has been on increase for over 10 years. Current experience in mobility cost with change of fuel price from N205 to between N620 and N650 has

made intra city transport cost to be increased by 300% and long distance journey by 200% in Nigeria (Ewuzie, 2023). Fuel is a major factor in generating heat for ignition, heat generation, vehicle propulsion, power generator, cooking and other energy required services. Since the discovery of oil in 1970s at Oloibiri in Delta State and relative neglect on agricultural output;



there was no plan for alternative fuel or proper management of crude oil in spite of astronomical increase in demand (Josiah et al, 2022). Countries like United States as noted by Babatunde et al (2022) have been attempting to use alternative fuel like Brazil with the use of maize, cereal crops, Compressed Natural Gas and Biofuels. PWC (2023) research publication noted that, Nigeria has been subsidizing her economy since 1970s as the price of petroleum products have been sold by the Price Control Act which did not allow the fuel price to go beyond regulated price. According to Molly (1992) the Nigerian fuel sporadic shortage emanated from inadequate local refinery capacity, faulty distribution or inadequacy of its facilities, lack of enough storage facilities and hoarding by road side resellers.

In 2016, subsidy was removed on some petroleum products like diesel and kerosene. However, it has been a big challenge for Nigerian governments from President Goodluck Jonathan, President Muhammad Buhari and recently President Bola Tinubu to remove subsidy on Petroleum Motor Spirit (petrol). This may partly due to the fact that, the effects of its removal will reflect on the transportation cost which influences all other economic costs in global supply chain. The pronouncement of amount used in subsidy became obvious as Nigeria needs to export her crude oil to refine abroad and the increase in exchange rate. Expressing the perception of World Bank to Nigeria's subsidy concept, Pwc (2023) stated that \$10.8 billion was generated as revenue by Nigerian government in the year 2000 and this amount increased to \$67.9 billion in the year 2010. However, Nigeria had spent half of her revenue on fuel subsidy and this trend resulted to Nigerian government under President Buhari to borrow N1trillion to finance fuel subsidy in the year 2022.

It is not a secret that, Nigeria's revenue like all other Organization of Petroleum Exporting Countries (OPEC) mainly relies on crude oil. Nigeria is the second largest oil producer after Libya in Africa (Olisah, 2020). Availability of crude oil in a country supposedly provides an edge for economic buoyancy and standard of

living. Umeji and Eleayan (2021) explained that, the natural endowment of crude oil in Nigeria has not reflected in its economy. Due to the fact that, this commodity is extracted in Nigeria, it is presumed that it should be refined, distributed and first utilized by Nigerians. According to Adekoya (2020) Nigeria has four major refineries that were programmed to produce 445,000 barrels per day- enough production volume for local consumption but today, the ones working are below this production capacity. The resolution made under past Nigerian governments was resorting to refine crude oil abroad and removal of subsidy. Over a decade now, past governments made attempts to resuscitate the refineries but hitherto, to no avail. The name of the organizations and various departments were changed or privatized for the purpose of efficiency; yet till date, Nigeria exports crude oil and imports refined petroleum products.

Sadly, governments at different times have not been able to concisely identify the problems with refineries and attempt the possibility of fixing them. When the refineries are not working and Nigeria has to export to foreign country to refine and undoubtedly bring lesser quantity back to the country with payment in currency higher than that of the country, plus the cost of shipment for onward and reverse logistics; the economy cannot remain the same. Dosunmu and Adepoju (2022) emphasized the effect of giving crude oil carriage to foreigners on employment of Nigerian seafarers, multiplier effects on shipbuilding and bane of Cabotage law. The principle of FOB (Free on Board) and Cost Insurance Freight (CIF) in incoterms (terms of trade) were also said to be unfavorable to Nigerian ship-owners as oil companies prefer foreign shipping companies who provide insurance and believed to have worthy vessels for oil carriage (Baru, 2018). Sometimes, ships leave the Nigerian shore without full load and the charges for both forward and reverse logistics will be paid. The multiplier effects will be on the country's economy as no marketer will involve in any unprofitable oil importation business. The upstream sector is responsible for the excavation of the crude oil from the oil field

while the downstream is for the refinement and separation of crude oil, including storage and transportation to various depots. It is a known fact that, the crude oil from which oil and gas are extracted comes from oil field within the maritime domain. Secondly, maritime transport is responsible for oil and gas carriage on international voyage as the only mode to transport the crude oil or products effectively at cheaper rate. Regrettably, out of 53 African countries, 38 are net oil importer (ADB, 2009). The supply chain of crude oil products from cargo throughput of import-export in Nigeria in particular is worrisome.

In spite of claims that it is not possible to rehabilitate the refineries or build new; a business mogul individual who perhaps used to see problems as opportunity especially if he can provide solution and make profit out of it with his political influence established a world-class refinery. The importance and interest of all Nigerians in the price of petroleum product especially its influence on transportation cannot be over emphasized. Transport is propelled by and the price of fuel is responsible for distribution cost, market cost, from agriculture to mineral to crude oil to shipping to air transport, level of consumption, production, disposition and poverty. Apart from this Louis, (2012) explained that fuel subsidy removal has significant impact on Small Scale Businesses like barbing saloon, fish sellers, restaurants, welder, hotels, electricians, e.t.c who depend on generators that they fuel which will increase their cost of living. Nigeria transaction system in the oil and gas sector permitted unprecedented environment for large scale of oil theft to paraphrase the word of Katsouris and Sayne (2013). Poor governance has paved way for organized crimes in Nigerian oil and gas sector and resulting into only few reaping the benefits to be enjoyed by all the citizens. The international connections of oil criminals with foreign buyers with currency higher than that of Nigeria, loading ships and connecting pipes not to talk of trans-border theft have wrecked Nigerian economy.

Transportation cost is majorly influenced by its operating cost (Wojuade and Oladosu, 2018).

Transport operating cost are many and include cost of fuel, spare parts, importation, clearing, shipping, lubricants, personnel, maintenance, tyre, condition of Nigerian roads which can also be attributed to poor design, lack of drainage, poor construction and pressure. From the account of Sabo et al (2019) it can be said that Nigeria used to have good policy documentation but lack transparency and accountability. This study therefore examined the relationship between transport charges and its operating cost arising from fuel subsidy removal in Nigeria.

Literature Review

Concept of Fuel Subsidy

Subsidy is a palliative measure that is meant to cushion the effect of allowing market forces to play its role in determining the price of petroleum products. According to Raji et al (2018) fuel subsidy is regarded as any measure used to retain the price of a product or service so that consumers pay less of the real market price. Onyeizugbe & Onwuka (2012) noted that it is the price that government pays on behalf of consumers so as to make it cheaper for them. Subsidy can be in form of gift, grant, tax concession, hybrid payment and other forms just to reduce the burden on the masses (Adebisi, 2011). This concept was introduced in the 1980s after the country sets up Nigerian National Petroleum Corporation. It can be observed that, discovery of crude oil in Nigeria from inception went wrong from how it should be managed. Nigeria keeps changing the structure and nomenclature of Nigerian National Petroleum Corporation first by creating Department of Petroleum Resources (DPR), Department of Petroleum Product Pricing Regulatory Agency (PPPRA) and Petroleum Equalization Fund (PEF). Now, the structure is NURC-Nigerian Upstream Regulatory Commission and Nigerian Midstream and Downstream Authority. According to JSTOR (2023) report, there are two types of subsidy: consumer based subsidy and producer based subsidy. The consumer based subsidy has been the one in operations without any recourse to producer based.

Concept of subsidy is not a bad one at all. It presupposes to alleviate poverty and guarantees affordable services for citizens of Nigeria (Iyobhebhe 2012). Subsidy plays a vital role in the operation of transport markets, possibly more so than in any other industry. This is because transport markets are made up of a combination of market forces and the actions of transport planning authorities, with subsidy playing the pivotal role in reconciling these two 'forces' in the actual market place. An understanding of the uses of subsidy in transport industries, and perhaps more importantly the issues that surround the payment of it, is therefore vital to any analyst of transport markets.

It is of a fact that, a lot of issues are surrounding fuel production, refinement and distribution in Nigeria. Expectedly, subsidy removal is to crash the market price as forces between demand and supply interplay. A report written by Katsouris and Sayne (2013) presented revelation on how fuel moves in Nigeria through corruption and till date we cannot still manage what we have. A popular maxim says "what you cannot measure, you cannot manage". Prior to now, Nigeria's crude oil is stolen in industrial scale. According to Katsouris and Sayne (2013) politicians, military officers, militants, oil industry personnel, oil communities are part of the organized crimes of corruption and fraud in the industry. Gulf of Guinea has been used to perpetrate organized crime for oil theft in Nigeria. Pipelines are being tapped; vessels are being loaded without proper monitoring and documentations.

Removal of fuel subsidy has its tone on everybody, many can no longer put their cars on the road, travels have reduced significantly, cost of living is higher and public transportation is now being used with non-motorized transport. Currently, as noted by Newsroom Nigeria (2023) a company called Deawoo has been awarded contract to refurbish and rehabilitate existing moribund refineries to generate 110,000 barrels per day. Special Adviser to the President Tinubu, Femi Ajayi opined that, people do not get facts about the state of refineries and muddle up issues to misinform the public. Previously,

Nigerian National Petroleum Cooperation (Ltd) awarded the rehabilitation of Port Harcourt refineries to an Italian company called Maire Tecnimont SpA at a cost exceeding \$1Billion. He maintained that, local refinement cannot substitute for subsidy and the differential price cannot be more than N10 if any.

Conceptual Framework

Figure 1 below shows the dependent and independent variables for the concept of relationship between cost of transportation (charges) and variables influencing the cost. The charge of transport service is influenced by distance, operating cost and economy of scale. According to Figure 1, the illustration of the framework depicts variable cost influencing the cost of transportation. The cost of transport is determined by the operating cost. The operating cost apart from capital cost includes; personnel cost, fuel cost, cost of tyre purchase, condition of road and available seat.

Basically, PMS fuel is one of the needed requirements for most of the vehicles used for transportation in Nigeria. There are different types of fuel ranging from petrol, diesel, gasoline, kerosene, Liquefied Petroleum Gas LPG and others. According to Pwc (2023) Nigeria needs to determine the number of vehicles various types of fuel and the latest estimate from National Bureau of Statistic data of 2018 stated that 11.8 million are the registered vehicles in the country.

The concept below in Figure 1 illustrated that, transport operators will consider all the variable costs regarding the fuel, the tyre, vehicle ownership, drivers' allowance, available seat per distance and condition of roads to predict the cost of transportation. Somuyiwa et al (2018) explained some costs incurred on road transport fleet management like capital cost for purchasing the vehicle, licensing cost for vehicle registration and particulars, maintenance or operating cost for fuel, oil, servicing, tyre costs, drivers' allowances and insurance. Transportation charges often times is calculated by the fuel used or consumed per kilometer as one of the major variable costs. Drivers are the most crucial factor in transport operation for they handle the

investment and what comes out of transport investment. Vehicle can be purchased through hire-purchase, loans, cooperative society, partnership and donations. The method of purchase can influence the charges. The cost of tyre is another factor as one of the most variable cost elements that is being replaced in vehicle operating cost. Drivers must be paid allowance

for smooth and continuous operation of transport. However, the number of seats for passenger and available capacity for load will also determine the cost of transportation. Most vehicle operators used to consider the condition of road as it has direct impact on the depreciation of the vehicle.

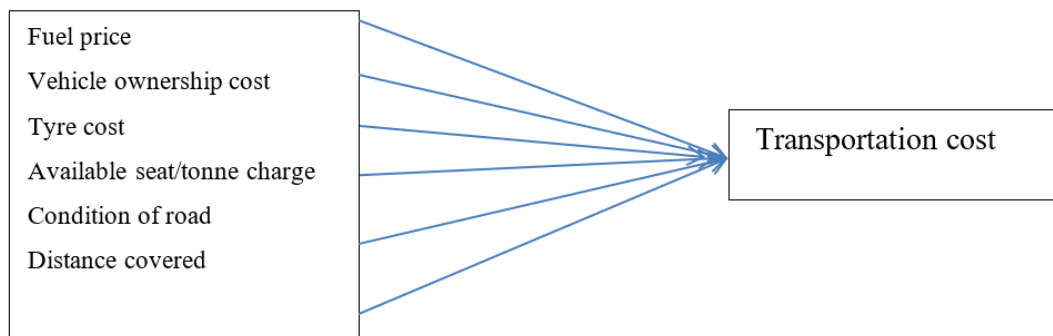


Figure 1. Conceptual framework for Transportation operating cost

Source: Authors' conceptual framework (2023)

Empirical Review

Transportation cost has impact on economy, continent and countries (Oosterhaven and Rietveld, 2005). Omotosho (2019) developed Keynesian new model to monitor the effect of global oil price on retail price and found out that under subsidy, the tendency for inflation to decrease and exchange rate depreciates in the short run. According to Obasi et al (2017) their research found out that the large scale of corruption in the oil sector metamorphosed to impoverished average Nigerians. Furthermore, they expressed that unlike Ghana, Nigerian government did not prepare for how to cushion the effect of fuel subsidy before embarking on subsidy removal. Research by Panou and Proios (2015) explained that affordability of transport is crucial to basic needs of life. Transport affordability improves access to medical care, education, socializing, and opportunities. Using affordability index, they noted that, the quality and quantity of mobility options can be affected by price of transportation. Low and medium income people are affected by the charges of transport. Transportation cost increases the cost

and charges of all other commodities and the ripple effect will be pronounced on the economy. In spite of transportation cost's tendencies to increase other commodities' cost, it has some advantages. As opined by Panou and Proios (2015) transportation cost forces people to limit their traveling, reduces parking, congestion and environmental pollution. There was a postulation that three component variables are responsible for transportation cost viz: ownership cost, auto use cost and transit use cost. Transportation cost seems to reduce as kilometer covered increases. As noted by Panou and Proios (2015) transportation affordability index showed that disadvantaged people are denied opportunities through transport and it is very important for economic activities. Cost of traveling is increased by fuel wastage and delay attributed to re-routing, the condition of logistics vehicle, number of vehicles on the road, the route space, condition of the road, conflicts of right of way and condition of other vehicles on the road (Somuyiwa and Adepoju, 2018). According to Gao et al (2019) and Rushton et al (2010) transportation costs can be fixed cost (standing), variable cost (running) and overhead

cost. The fixed ones are depreciation cost, licenses cost, insurance, drivers' cost and interest on capital. The variable costs are: fuel cost, tyre, repair and maintenance and driver's overtime. The last one is the overhead costs which include office, equipment and other indirect cost not related to operating costs.

Bulletin FAL (2022) expressed the influence of transportation cost on foreign trade and exchange rate by explaining that reduction in transportation cost can facilitate trade and increase importation and vice-visa. It was observed that increase in transportation cost reduces trade by 80% (Lima, 2001). Radelet and Sach (1998) found out that, increased in transportation costs limit foreign investment, decreases employment opportunities, lower

savings, reduce accessibility to technology and knowledge transfer.

Methodology

This research used correlational research design and data from secondary source from the Statista on the Premium Motor Spirit price (PMS) because it is the most highly demanded petroleum products in Nigeria. The collected data collected with the data of the country's Gross Domestic Products (GDP) were correlated. The collected secondary data from Statista on inflation rate and compiled Premium Motor Spirit (PMS) prices per can be seen in the Table 1 below.

Table 1. Economy indicators variables

S/N	Year	Petrol price/litre	Inflation%	GDP in US \$
1	2011	65	10.83	2543.51
2	2012	97	12.22	2756.41
3	2013	97	8.49	2998.07
4	2014	97	8.05	3222.69
5	2015	145	9.01	2718.59
6	2016	145	15.70	2176.01
7	2017	145	16.50	1968.56
8	2018	145	12.10	2153.09
9	2019	145	11.40	2229.85
10	2020	165	13.25	2083.16
11	2021	185	16.95	2088.09
12	2022	206	18.85	2202.46
13	2023	620	24.03	2280.12

Source: Statista (2023) and Authors' compilation (2023), World Bank www.macrotrends.net/countries/NGA/Nigeria/inflation

Results and Discussion

In order to examine the impact of fuel subsidy, three variables that are indicators (PMS pump price over the years, the inflation rate over the years and GDP over the years -2011-July 2023) of Nigerian economy were correlated with the aid of Pearson Moment Product Correlation Coefficients technique. The data for the three

variables can be seen in Table 1. Table 2 presented the generated result from the analysis. In correlation analysis, a matrix table was formed where there is perfect correlation of a variable against itself as can be seen for all variables in Table 2 for correlation analysis result with value of 1.

Table 2. Correlation Analysis Result

Correlations				
		price	Inflation	GDP
price	Pearson Correlation	1	.800**	-.290
	Sig. (1-tailed)		.001	.169
	N	13	13	13
Inflation	Pearson Correlation	.800**	1	-.652**
	Sig. (1-tailed)	.001		.008
	N	13	13	13
GDP	Pearson Correlation	-.290	-.652**	1
	Sig. (1-tailed)	.169	.008	
	N	13	13	13

** . Correlation is significant at the 0.01 level (1-tailed).

Source: Output from analysis (2023)

However, when the price of fuel (PMS) increases; the inflation also increase with r (correlation) value of 0.800 at $p < 0.05$ i.e 0.001. Secondly, as price of fuel increases, the Gross Domestic Product of Nigeria reduces by 0.290. There is already positive correlation between inflation and fuel price increase with $r = -0.800$ at $p < 0.05$ level of significance. It can also be observed that, as inflation increases, the GDP of the country reduces by $r = -0.652$ at $p < 0.05$ level of significance. On the latter part, GDP is negatively correlated with fuel price and inflation with r values of -0.290 and -0.652 respectively though with $p > 0.05$ for fuel rice but $p < 0.05$ for inflation. Since GDP is a measure of economic output of a particular country, it reflects the element of standard of living and economic situation of a country. Converting r (s) into coefficient of determination R , we need to square the r (s). And again, to get the percentage, we multiply by 100. There inflation increases by 64% with increased fuel price and as increase in fuel price is affecting or decreasing GDP by 42.5%.

It can be seen that fuel is very critical to the development of Nigeria. It has a direct effect on GDP and surprisingly price inflation. Solving one problem perhaps of fuel has a significant effect on economy.

The bottom line of the discussion centered on changing one variable as it has influence on other two. Fuel especially PMS in this context is

one variable that can influence the economy of any nation. It can mitigate the rising inflation and Gross Domestic Product as can be observed from the output of this research

Conclusion and Recommendations

There are two things that should be done as alternative to subsidy removal; the first is to make the supply of fuel more than the demand. This will therefore reduce to minimum the mobility cost arising from reduction in fuel cost. However, comparing the number of vehicles apart from household demands for P.M.S among other petroleum products and the production cum refineries available, it is unlikely that the cost of fuel will reduce over a long period of time. The second option is to find alternative fuel like other countries because the demand for crude oil as major revenue may dwindle over time if the buyers who are planning vigorously on alternative are able to do away with our crude oil. The use of electric vehicle, solar powered vehicles, hybrid vehicles and policy direction that will encourage non-motorized transport can assist Nigeria to forestall future challenges of global oil demand. Energy or electricity is crucial to Nigeria's economic challenges as an offshoot of this research.

Nigeria must work on how to refine the crude oil locally and possibly provide conditional

incentives for more investors like Dangote Group as benefits accruable to refining locally has gone. Nigeria's economy can be strengthened by making sure all commodities that we are selling to other countries are valued in Dollar but paid in Naira equivalent, privatize refineries with monitoring and strategic policies as it seems government cannot operate it effectively, monitor loopholes through smuggling and bunkering and measure performance of all actions stated.

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