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Impacts of Fuel Subsidy on Economic Growth in Nigeria 2005–2022: Driving Economic Growth through Fuel Subsidy Removal Policy and Implementation

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Abstract: This study aims to examine the impacts of fuel subsidies on economic growth in Nigeria from 2005 to 2022, driving economic growth through fuel subsidy removal policy and implementation. Fuel subsidies have long been a significant policy measure in the country, aimed at reducing the cost of fuel for consumers. The study analyzes and understands the economic consequences associated with the removal of fuel subsidies in Nigeria. An empirical research approach is utilized with a combination of quantitative data analysis and econometric modeling techniques. The primary focus of the analysis is on changes in key macroeconomic variables during fuel subsidies. The study explores the effects on government revenue, recurrent expenditure, capital expenditure, tax, inflation, exchange rate, technology, and GDP. The outcomes of this research include valuable insights into the impacts of fuel subsidies on economic growth in Nigeria. Findings from this study can inform policymakers, government agencies, and stakeholders about the potential consequences of subsidy reforms on the overall economy. Moreover, the results contribute to the ongoing policy discussions surrounding the removal of fuel subsidies and aid in the formulation of evidence-based strategies to ensure sustainable economic growth and development.

Introduction

The Nigerian economy has received subsidies in multiple sectors over an extended period of time, encompassing fuel, education, electricity, and foreign exchange (Abideen, 2011). The implementation of fuel subsidies originated in the 1970s and was formalized in 1977, subsequent to the enactment of the Price Control Act. This legislation prohibited the sale of certain products, such as gasoline, at prices exceeding the prescribed regulatory limits. The administration of subsidies in Nigeria has been marred by significant allegations of corruption and mismanagement, despite the inherent nobility of the concept (Oyedele & Akinduyite, 2022). In 2016, the subsidy for kerosene was eliminated, following the deregulation of diesel thirteen years prior. The subsidy provided for Petroleum Motor Spirit (PMS) has emerged as a significant obstacle for the administrators of the Nigerian economy. According to Oyedele and Akinduyite (2022), a significant proportion of the country's annual inflow is allocated towards financing the subsidy scheme. There are several factors

that contribute to the significant increase in subsidy amount, including the fluctuating price of crude oil in the global market, the volume of PMS consumption (although subject to debate), and the devaluation of the Naira. Given the importance of the financial commitment associated with the subsidy regime, it is imperative to thoroughly examine this program.

The concept of fuel subsidy removal pertains to the act of eliminating or reducing the financial support provided by the government for fuel prices. Governments often employ subsidies as a means to mitigate the financial burden on consumers by reducing the cost of fuel, thereby maintaining artificially suppressed prices. The decision to eliminate fuel subsidies is frequently motivated by a range of factors, such as fiscal constraints, economic restructuring, and the aim of enhancing market efficacy (Bamidele, 2023). When a governmental entity opts to eliminate fuel subsidies, it relinquishes control over the pricing of fuel, thereby enabling market forces to dictate its cost. This typically entails aligning the price of fuel with international market rates or relying on domestic market mechanisms for determination. According to Oyedele and Akinduyite (2022), the implementation of this policy change has the potential to exert substantial influence on multiple dimensions of an economy, encompassing government finances, inflation rates, public welfare, and economic growth.

A subsidy refers to a type of financial assistance or backing provided to an economic sector, institution, business, or individual, typically with the intention of advancing economic and social objectives (OECD, 2022). While subsidies are often associated with government assistance, it is important to note that the term can encompass various forms of support, including those provided by non-governmental organizations (NGOs) or implicit subsidies. Subsidies encompass a range of manifestations, which include direct forms such as cash grants and interest-free loans as well as indirect forms like tax breaks, insurance coverage, low-interest loans, depreciation write-offs, and rent rebates. Moreover, these categories can encompass a wide range of behaviors, varying in scope from general to specific and in terms of their adherence to legal and ethical standards. The predominant types of subsidies are those provided to either the producer or the consumer. Producer/production subsidies are implemented to enhance the economic welfare of producers through the provision of market price support, direct support, or payments to factors of production. Consumer subsidies are a prevalent mechanism that effectively decreases the cost of goods and services for consumers. In the Nigerian context, the cost of purchasing gasoline was comparatively lower in previous years due to the implementation of fuel subsidies. Determining the positive or negative implications of subsidies is generally regarded as a normative evaluation. According to the Organization for Economic Co-operation and Development (OECD, 2022), subsidies, as a type of economic intervention, are fundamentally at odds with the demands of the market. Nevertheless, they can also serve as instruments of political and corporate cronyism. While subsidies can hold significance, a considerable number of them exhibit "perverse" characteristics. In order to be classified as 'perverse', subsidies must exhibit effects that can be clearly demonstrated and have a significant negative impact on both the economy and the environment.

Despite its status as the largest oil producer in Africa, Nigeria continues to heavily depend on imported refined oil. The four refineries located in Port Harcourt I and II, Warri, and Kaduna collectively possess a total capacity of approximately 445 thousand barrels per day (bpd), effectively meeting 63 percent of the nation's domestic demand. Nevertheless, operational failures, inadequate maintenance, sabotage on crude oil pipelines supplying the refineries, theft, and fire incidents have resulted in the underutilization of these refineries, as reported by the Energy Information Administration (EIA, 2012) and Businessday (2013). During the period spanning 2009 and a portion of 2010, the nation was compelled to import approximately 85 percent of its refined oil requirements due to notably diminished refinery operations. According to Rice (2012), alternative estimates indicate that domestic refineries are capable of meeting a maximum of 25 percent of domestic consumption. The Nigerian government implements a subsidy on imported refined fuels with the aim of reducing poverty rates by ensuring a stable consumer price at the pump. The determination of daily and monthly subsidy rates is carried out by the Nigerian Petroleum Products Pricing Regulatory Agency (PPPRA). The determination of subsidies is conducted on a daily and monthly

basis by the Petroleum Products Pricing Regulatory Agency (PPPRA). This determination is made by assessing the difference between the projected price of imported fuel, which includes associated margins, and the pre-established domestic price that is regulated by the government.

In the year 1980, the cost of fuel reached a value of 15.3 million. Subsequently, with the advent of the SAP era, the price of fuel experienced a significant rise, nearly reaching $4,000. This increase amounted to a 97.5% growth relative to the previous price of $20,000. At the conclusion of the Structural Adjustment Program (SAP) era, the cost of fuel had escalated to $70, representing a 16.67% increment from the preceding price of $60. In 1993, the price experienced a significant increase to N5 before subsequently decreasing to N3.75 following a series of protests. During the initial phase of the democratic era, the price of fuel experienced a notable increase, rising by approximately 90 percent from its previous value of N11 to N20. Subsequently, by the year 2002, the price had further escalated to N26, reflecting a growth of 18.15 percent compared to the preceding price. The price subsequently rose to 65 naira in 2006. On January 1, 2012, there was a significant increase in the pump price of petroleum, reaching N141, which represented a substantial rise of 117%. However, this increase was subsequently reduced by 31.20% to N97 and has since remained at this level. However, it is noteworthy that the GDP per capita has exhibited a notable surge over the preceding three decades, albeit with a less than remarkable growth rate. The GDP per capita exhibited a growth rate of 1.3 percent, starting from a value of $764.19 in 1980. However, between the years 1980 and 1986, the average GDP per capita experienced a decline of -5.8 percent. Following a decline of 13.1 percent in 1987, the growth rate experienced a subsequent recovery, reaching 9.9 percent in 1990. At the onset of the new millennium, the gross domestic product (GDP) growth rate was recorded at 2.7 percent and has consistently maintained a positive trajectory thereafter, reaching its highest point of 30.3 percent in the year 2004. The average GDP growth rate during the period from 2005 to 2011 was 3.7 percent. The gross domestic product (GDP) growth rate reached 3.6 percent by the conclusion of 2012. The sluggish pace of economic expansion has been ascribed to several factors, including the impact of the oil surplus in the early 1980s, the inefficacy of the Structural Adjustment Program (SAP), the prevalence of political instability within the country, the pervasive issue of corruption, inadequate economic governance, and the presence of policy inconsistencies by the government.

Statement of the Problem

The issue of fuel subsidy has been a subject of intense debate and scrutiny in many countries around the world including Nigeria. While fuel subsidies are often implemented with the aim of reducing the financial burden on consumers and promoting economic stability, they also have significant implications and consequences. Assessing the impact of fuel subsidy on Nigeria's economic growth is a crucial aspect. This involves examining key indicators such as GDP growth rate, employment rates, investment levels, and industrial development to determine whether the presence or absence of fuel subsidy has influenced the country's overall economic performance. By investigating these dimensions, the study aims to provide a comprehensive understanding of the impacts of fuel subsidy on economic growth in Nigeria from 2005 to 2022.

Objectives of the study

The main objective of the study is to examine impacts of fuel subsidy on economic growth in Nigeria 2005–2022 focusing on economic growth through fuel subsidy removal policy and implementation. Superficially, the study sought to examine the relationship between fuel subsidy on economic growth in Nigeria 2005–2022.

Hypothesis

There is no significant relationship between fuel subsidy on economic growth in Nigeria 2005–2022.

Literature Review

In recent times, there has been significant attention given to the relationship between oil production and prices, particularly the reliance of oil prices on real output. This is of particular importance due to the substantial reliance on crude oil earnings by numerous countries, including Nigeria. The

observed phenomenon can be readily attributed to the recognition that there exists an inverse relationship between the rise in oil prices and the growth of Gross Domestic Product (GDP), while a direct relationship is observed between oil price increases and production costs. According to Papapetrou (2009), the empirical evidence demonstrates that there is an intensified inverse correlation between oil prices and economic activity, particularly during periods characterized by rapid fluctuations in oil prices and heightened volatility in the oil market. The economic consequences of oil price volatility have been the subject of extensive debate. However, empirical evidence indicates a lack of consensus regarding the precise effects of oil price volatility (Schmidbauer and Kalaycioglu, 2008). According to the study conducted by Gronwald et al. (2009), the primary determinants of oil prices are global economic development as well as the power and speculative behavior of OPEC, which introduce stochasticity to the oil market. The macroeconomy is greatly influenced by oil prices due to the extensive reliance on oil by numerous countries, rendering oil prices highly consequential for various macroeconomic factors (Ewing & Thompson, 2007).

According to Nuhu-Koko (2008), there is a significant allocation of funds from the national treasury towards subsidy expenditures. According to Adeola (2010), the value of the economy in 2006 amounted to approximately US$2.03 billion, which accounted for 1.4% of the country's GDP. Subsequently, in 2007, this value experienced an increase to US$2.3 billion, representing 1.3% of the GDP. Notably, there was a significant surge in the economy's value in 2010, reaching US$5.37 billion. This growth can be attributed primarily to factors such as escalating oil prices, the depreciation of the exchange rate, and expanding demand. During the period from 2008 to 2010, it was estimated that the government made petroleum subsidy payments to marketers of petroleum products amounting to approximately US$10.7 billion. The aforementioned figures surpassed the overall capital allocation towards priority sectors as stated in the 2009 budget, which amounted to US$6.57 billion. These sectors include Security (US$0.62 billion), the Niger Delta (US$0.68 billion), Critical Infrastructure (US$3.20 billion), Human Capital Development (US$1.11 billion), and Land Reform and Food Security (US$0.96 billion).

According to Lawan (as cited in Odemwingie, Ohuegbe, & Mu'azu, 2012), a total of 232 billion naira was disbursed as a subsidy to marketers for PMS in 2011. However, it has been observed that, despite the substantial subsidy, the supply of PMS was not effectively carried out. Consequently, this subsidy program has been identified as a mechanism that facilitates the mismanagement of revenue. The researcher made the observation that the computation of subsidies can be divided into two distinct segments, namely the landing cost and the distribution cost. Specifically, the landing cost component accounts for the entirety of the total cost, which amounts to 153.64 naira. The cost breakdown for the mentioned items is as follows: Products, Insurance, and Freight amount to 141.40 naira; Lightering Expenses (SVH) total 4.03 naira; Traders Margin is 1.19 naira; Storage Charges amount to 2.60 naira; and the NPA Port charge is 0.62 kobo. The cost of Jetty Depot services is 0.80 kobo, while the Distribution Cost, which encompasses the overall cost of 15.49 naira, includes various components. The retailer's margin is recorded as 4.60 naira, while the transporter's margin is documented as 2.99 naira. Additionally, the dealers' margin is reported as 1.75 naira. The marine transport average (MTA) is noted as 0.15 kobo, and the budgeting fund is recorded as 5.85 naira. Lastly, administrative charges are documented as 0.15 kobo. Moreover, during the tenure of Goodluck Ebele Jonathan, the subsidy re-investment program (Sure-P) was implemented with the aim of utilizing the funds obtained from the partial elimination of subsidies to alleviate the challenges faced by the Nigerian population as a whole. The establishment of the committee was intended to supervise and guarantee the efficient and prompt execution of projects that would be financed using the savings obtained by the federal government through subsidy removal. The primary objective of the Subsidy Reinvestment and Empowerment Program (SURE-P) is to address the adverse consequences resulting from the elimination of fuel subsidies while also promoting economic development by allocating resources towards essential infrastructure projects. The savings resulting from the removal of subsidies under the Subsidy Reinvestment and Empowerment Program (SURE-P) are intended to be allocated towards various key sectors of the economy, including Power, Health, the Niger Delta, and Youth development. Based on the findings of Omafume (2014), it is reported that Sure-P indicates that the federal government is responsible for overseeing 41% of the

intervention, while the states and local governments receive 54% of the allocation. The remaining 5% is allocated towards ecological initiatives. Dr. Bright Okogu, as cited by Omafume (2014), stated that the Federal Budget Office's Director-General confirmed that Sure-P commenced receiving funds from fuel subsidies in July 2012. By the conclusion of the year 2012, it had garnered a sum of 126 billion naira. In the subsequent year, 2013, this figure increased to 180 billion naira, and in the subsequent year, 2014, it further rose to 135 billion naira. Consequently, the cumulative total reached 441 billion naira by the culmination of the year 2014. The primary goals of these funds include enhancing maternal and child health services, improving accessibility to mass transit, offering zero-interest loans for the establishment of transportation operations, establishing vocational training centers across all states in the country and the federal capital territory, constructing road infrastructure projects, promoting economic transformation through investment in crucial infrastructure projects, providing internships for unemployed Nigerian graduates, and mitigating the effects of petroleum discontinuation on the population.

The government's decision to remove subsidies resulted in widespread protests and social unrest throughout the nation, as the official price of fuel increased significantly from 67 naira per liter to 141 naira per liter. Lagos, the second-most populous city in Africa, exhibited the characteristics of a deserted urban area following the unfortunate events of January 1, 2012 (Onyishi, Eme, & Emeh, 2012). In the year 2011, Nigeria incurred an approximate expenditure of $8 billion due to its fuel subsidy, and it was anticipated that the cost for the subsequent year, 2012, would be even higher. According to Donovan (2011), Nigeria generated total revenue of $59 billion from its oil exports in 2010. Zainab Ahmed, the Executive Secretary of the Nigerian Extractive Industries Transparency Initiative (NEITI), as cited by Salau (2015), asserts that the substantial funds generated from oil exports were deemed sufficient for the purpose of refurbishing existing refineries and constructing new ones. The speaker mentioned that the federal government has allocated a total of 4.8 trillion naira over the course of the past seven years as a subsidy for petroleum products imported into the country. Additionally, according to the most recent NEITI Audit Report from 2012, a sum of 1,355 trillion naira was earmarked for subsidy payments. Of the aforementioned sum, a total of 690 billion naira was disbursed, thereby imposing a debt liability of 655 billion naira on the federal government. The data indicates that a total of 116,554 billion naira was disbursed between the years 2006 and 2008, followed by a sum of 3 trillion naira between 2009 and 2011. Additionally, an amount of 690 billion naira was paid out in 2012. According to NEITI, it is argued that the subsidy payments exceed the necessary funds required for the repair or construction of refineries. This could potentially reduce the need for importing refined products and discourage marketers from relying on such imports. However, Nigeria continues to heavily depend on imported refined fuel, accounting for over 70 percent of its domestic demand while also providing importers with a partial refund of the supply cost. The provision of subsidies creates a disincentive for private investors who have acquired refining licenses, as they are apprehensive about the potential inability to recoup costs due to the absence of fuel prices determined by market forces. The implementation of fuel subsidies in Nigeria has had the unintended consequence of deterring further investments in the country's oil sector by artificially suppressing domestic oil prices. Since the year 2000, Nigeria has granted a minimum of 20 refinery licenses to private enterprises. However, none of these licenses have resulted in the establishment of a refinery. This can be attributed to the inability of investors to recover their investments due to the presence of an artificially low price structure. In addition, the provision of subsidies has led to the allocation of limited public resources away from investments in essential infrastructure. This has placed a strain on government resources. Moreover, the significant discrepancy in fuel prices resulting from the subsidy has created an incentive for the illicit smuggling of petroleum products across national borders to neighboring countries, where prices are considerably higher than in Nigeria.

According to Kemp (2011), it is imperative to establish a pricing structure for petroleum products that accurately reflects their complete economic value, commonly referred to as the market price. This approach ensures that the nation can derive benefits from production by means of tax revenues while also providing direct financial assistance schemes to aid economically disadvantaged consumers. In their empirical analysis, Chike and Nwachukwu (2011) examined the veracity of the

fuel subsidy and arrived at the conclusion that it is indeed a factual occurrence. Furthermore, they recommended that the government exercise control over the extent of fuel subsidies that exist within the nation.

Empirical Studies

In their study, Inegbedion, Obadiaru, and Abiola (2022) examined the impact of petroleum subsidy withdrawal and fuel price increases on the Nigerian economy. The objective of this study was to assess the impact of petroleum subsidy removal on fuel price hikes and price increases in other sectors of the Nigerian economy. The input-output model was utilized to ascertain the value added per sector based on the computed table of the flow of goods. Consequently, the effects of various magnitudes of reductions in petroleum subsidies (specifically, 10%, 20%, 30%, 40%, and 50%) on the prices of goods and services from different sectors were calculated. The findings indicate that the reduction of petroleum subsidies has a stimulating effect on the prices of petroleum products. These price increases, in turn, lead to higher transportation fares. The subsequent increase in transport fares then has a cascading effect on the prices of other products due to the interconnectedness and interdependency among different sectors. It was proposed that policymakers should consider the economic ramifications of subsidy removal, among other factors.

In their study, Akinyemi et al. (2017) conducted an analysis to examine the effects of the removal of refined petroleum subsidies on the agricultural sector in Nigeria. The findings of their research provide evidence in favor of a complete elimination of fuel subsidies, as they are shown to enhance the overall performance of the agricultural sector. The study conducted by Olaniyi (2016) examined the impact of fuel subsidies on transportation expenses and rates in Nigeria. The author noted that fuel subsidies play a crucial role in improving the well-being of citizens, particularly in middle- and low-income countries. However, the elimination of these subsidies has a substantial impact on the determinants of transportation costs and rates, resulting in increased expenses in the transportation sector.

The study conducted by Lorussoa and Pieronib (2018) examined the factors and outcomes associated with oil price shocks for the economy of the United Kingdom. The researchers evaluated the impacts of oil price fluctuations on the economy of the United Kingdom using a methodology that enabled the separation of oil price fluctuations from the underlying causes of the shock. The researchers discovered that various categories of oil shocks were responsible for the effects that fluctuations in oil prices had on macroeconomic indicators in the United Kingdom. Additionally, they observed that an increase in the real oil price leads to a corresponding rise in domestic inflation.

In their study, Fueki et al. (2018) examined the impact of expectations in the crude oil market on oil price shocks and their subsequent effects. To investigate this, they utilized a structural vector autoregressive model to analyze the key factors contributing to fluctuations in oil prices. Specifically, they assessed the degree to which expectations influenced the future aggregate demand and supply of crude oil. The findings of the study indicate that approximately 30–35% of past fluctuations in oil prices can be attributed to anticipated changes in demand and supply.

Theoretical framework

Big Push Theory

Theoretical framework refers to the conceptual structure that guides the development of a research study. It provides a foundation for understanding the research problem. The theory of the Big Push posits that in certain economic contexts, a coordinated and substantial investment in multiple sectors can generate a self-sustaining cycle of growth and development. This theory suggests that by simultaneously investing

The theory commonly referred to as the "Big Push" is attributed to Professor Paul Rosenstein-Rodan. According to Jhingan (2012), the concept of a comprehensive program is recognized as essential for addressing the challenges of development in an underdeveloped economy and initiating a trajectory towards progress. This program requires a minimum level of investment to overcome the obstacles hindering development. The theory in question posits an argument that can be metaphorically

compared to the process of an airplane ascending from the ground. In order for an airplane to become airborne, it is necessary for it to reach a crucial threshold of ground speed. The absence of this crucial ground speed renders the aircraft incapable of initiating takeoff. Drawing a parallel to the economy of a nation, the successful initiation of an economy on a trajectory of development necessitates the implementation of a substantial minimum investment. According to Jhingan (2012), the prerequisites in this context pertain to the indivisibilities and external economies that result from a minimum level of investment. According to Rosenstein-Rodan, there exist three distinct types of indivisibilities and external economies, specifically: indivisibilities within the production function, indivisibility of demand, and indivisibility in the supply of savings (Jhingan, 2012). The primary focus in the first category of indivisibilities and external economies lies in the concept of social overhead capital, which holds significant importance. In order to implement this solution, a substantial initial investment is required by the economy. Social overhead capital services, which encompass fundamental industries such as power, transportation, and communications, are characterized by their indirect productivity and extended gestation period. According to Jhingan (2012), it is not possible to import them. The lack of social overhead capital poses a significant obstacle to development in underdeveloped economies. As Jhingan (2012) argues, a substantial initial investment in social overhead capital is required to facilitate prompt and productive investment. The second type pertains to the concept of indivisibility or complementarity of demand. The establishment of interdependent industries is necessary for this endeavor. The concept at hand posits that the establishment of these industries engenders a scenario in which producers become customers of one another, thereby generating a market for their respective goods (Jhingan, 2012). The demand for goods in this context exhibits a complementary nature, which serves to mitigate market risks and foster investment incentives. Put differently, the concept of demand indivisibility can only be achieved under the condition of a substantial minimum level of investment in industries that are interdependent. The final type pertains to the indivisibility of savings supply. It is evident that investment can be pursued in circumstances where there is a substantial accumulation of savings. Nevertheless, attaining this objective poses challenges given the prevalence of poverty in developing nations. This issue can be mitigated by ensuring that any income generated from investments is saved in a manner that maintains a significantly higher marginal rate of saving compared to the average rate of saving. In order to initiate sustainable growth in underdeveloped economies, it is necessary to implement a significant investment in the form of a minimum quantum, taking into account three key factors: the presence of three indivisibilities and the resulting external economies. The primary focus in the Nigerian context is currently on the elimination of the fuel subsidy, which has resulted in the allocation of significant funds that could have otherwise been directed towards investments in diverse sectors of the Nigerian economy. For example, through the implementation of significant initiatives and substantial investments in quantum technology, additional sectors of the economy will be established in a manner that fosters interdependence for market viability. Therefore, this theory provides support for the argument made in this study that the removal of fuel subsidies can generate substantial financial resources. These resources can then facilitate the minimum level of investment necessary to effectively transform the Nigerian economy in a positive manner.

Research Methodology

Research Design

The study employed a survey design methodology. The chosen approach was deemed suitable as it facilitated the researcher in effectively describing, examining, documenting, analyzing, and interpreting the variables identified in the study. Additionally, the usefulness of the data is enhanced by the substantial size of the population from which it was gathered. According to Ezejulue and Ogwo (1990), the primary objective of conducting survey research is not solely to gather data but rather to uncover significance within the data collection process. This enables a more comprehensive understanding, interpretation, and explanation of facts and events. It was emphasized that the terms "descriptive" and "survey" are used interchangeably to refer to the aforementioned type of research.

Nature and Source of Data

The nature and source of data refer to the characteristics and origin of the information used in a study or research project. The primary source of data for this research primarily consists of secondary data. The data utilized in this study were sourced from a range of publications issued by the Central Bank of Nigeria (CBN), including the statistical bulletin, statement of account, annual report, and bulletin, as well as publications from the National Bureau of Statistics (NBS).

Data analysis method

The collected data underwent analysis utilizing the ordinary least squares regression method (OLS) in order to examine the nature of the relationship between the dependent variables and the remaining independent variables.

a. R^2 – coefficient of multiple determinations and adjusted R^2:

This was used for testing and to show the percentage of the total variable explained by the variation in the independent variables i.e. changes in ao, a1, a2, a3. The value of R^2 lies between 0 and 1, and the formula is stated as;

$R^2 = 1 (1- R^2) N-1 N-K$

b. T- statistics:

This is used to test for the statistical significance of the individual regression coefficient. A two tailed test is conducted at 5% level of significance. The computed T-ratio with N-K degree of freedom is shown below;

$t^* = a1$

$S (a1)$

The coefficient of ao, a1, a2, a3 is divided by the standard error. The null hypothesis H1 = a1 = 0 is tested against the alternative hypothesis H2: a1

4 0. If $t^* > t0.025$, accept the null hypothesis

c. F-statistic:

This test measures the overall significance of the entire regression plane. The F-test aims at finding out whether the joint influence of the independent variables (ao, a1, a2, a3) do actually have any significance to the computed F-ratio. F* is computed with the theoretical F with V1 and V2, N-K degrees of freedom.

$F^* = R^2/ K-1 (1-R^2) / (N-K)$

The null hypothesis H1: a1 = 0. If $F^* > F0.05$, we reject the null hypothesis showing that the whole regression is significant, otherwise, we accept the null hypothesis.

The second-order test for the possible evaluation of the stochastic assumption of the OLS model is equally conducted.

d. Durbin-Watson d-statistics:

This is used to test for the presence of the incidence of autocorrelation.

Decision rule:

- If $d^* < dL$, we accept the null hypothesi and conclude that there is no negative correlation of the first order.
- If $d^* < (4-dL)$, we reject the null hypothesis and accept that there is no negative autocorrelation of the first order.
- If $dU < d^* < (4-dU)$, we accept the null hypothesis of no autocorrelation.
- If $dL < d^* < dU$ or if $(4-dU) < d^* < (4- dL)$, the test is inconclusive.

In order to compliment the study, models were specified for entrepreneurial Orientation and the growth of small scale timber business with particular reference to South-South region of the country. The data collected in the research was edited, coded, classified on the basis of similarity and then tabulated. To permit quantitative analysis, data was converted into numerical codes representing attributes or measurement of variables. Descriptive statistics such as frequency distributions, percentages and frequency tables were used to summarize and relate variables which were attained from the study. The study also used regression and correlation analysis. Specifically, the regression model was of the form:

Model Specification

EQUATION

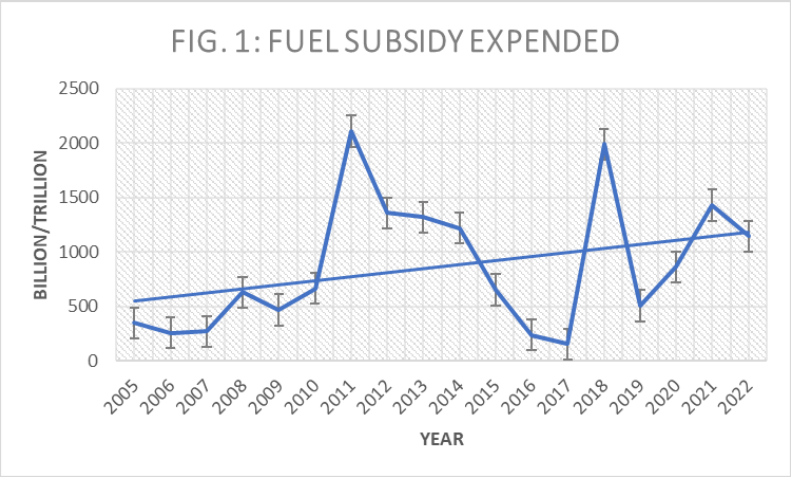
Econometrically the model is stated thus:

$a_0 + a_1 LFS + a_2 LTR + a_3 LRE + a_4 LCE + a_5 LT_{t-1} + a_6 LTI_{t-1} + LIR\ a_7 + LER\ a_7 + LGDP\ a_8 + e_t$
Where:

$a_0 - a_8$	=	Parameter structure/estimate of timber equation
e_t	=	Error term or disturbance term
LFS:	=	Log of Fuel Subsidy
LTR	=	Log of Total Revenue
LRE	=	Log of Recurrent Expenditure
LCE	=	Log of Capital Expenditure
LT	=	Log of Taxation
LT	=	Log of technology proxied for economic development
LIR	=	Log of Inflation rate
LER	=	Log of Exchange Rate
LGDP	=	Log of Gross Domestic Product

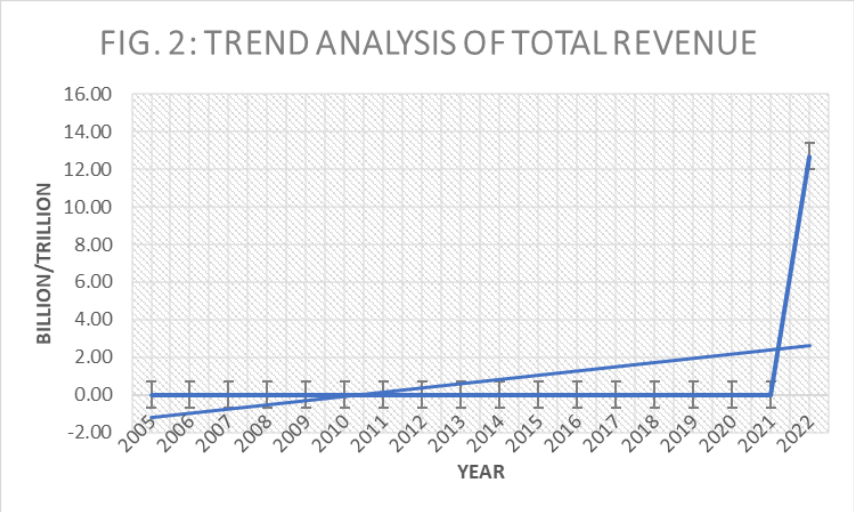
Correlation analysis was used to check on the overall strength of the established regression model (coefficient of determination-r^2) and also the individual significance of the independent variables (P-Values or t-test).

RESULT AND INTERPRETATION



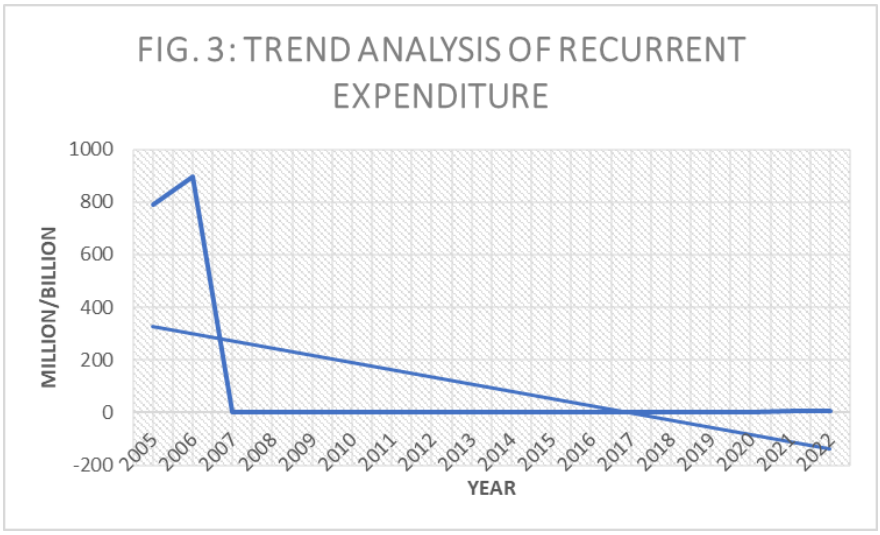
Source: Researcher's Extract from CBN (2023)

The above figure shows analysis of trend of fuel subsidy expended in Nigeria. From the graph above, it can be observed that fuel subsidy expended has been fluctuating throughout the observed years from 2005 to 2022. Fuel subsidy expenditure has an impact on government expenditure on other sectors of the economy as well as the return on investment.



Source: Researcher's Extract from CBN (2023)

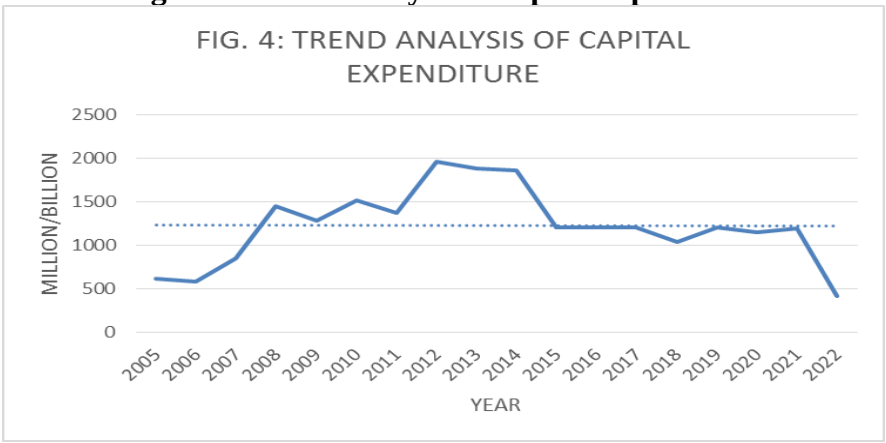
The above figure shows analysis of trend of total revenue in Nigeria. From the graph above, it can be observed that total revenue has been progressively steady from year 2005 to 2021 and has increased in 2022.



Source: Researcher's Extract from CBN (2023)

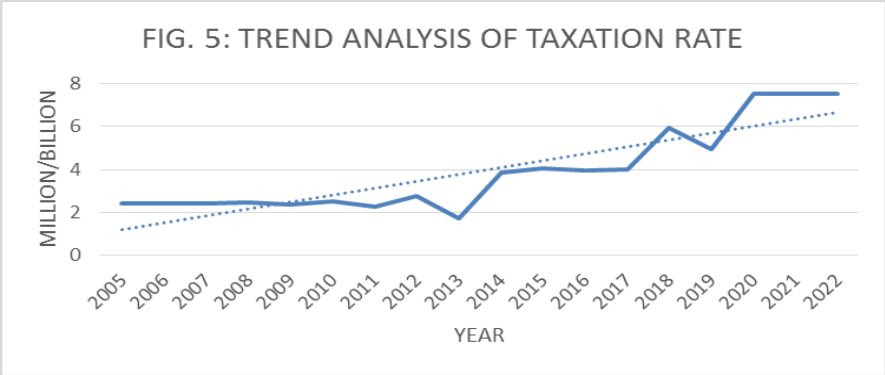
The above figure shows analysis of trend of recurrent expenditure in Nigeria. From the graph above, it can be observed that recurrent expenditure was in millions from year 2005 to 2006 and has relatively a steady increase to billions since then. In 2020 there was an injection of fund into the system after the pandemic.

Figure 4: Trend analysis of capital expenditure



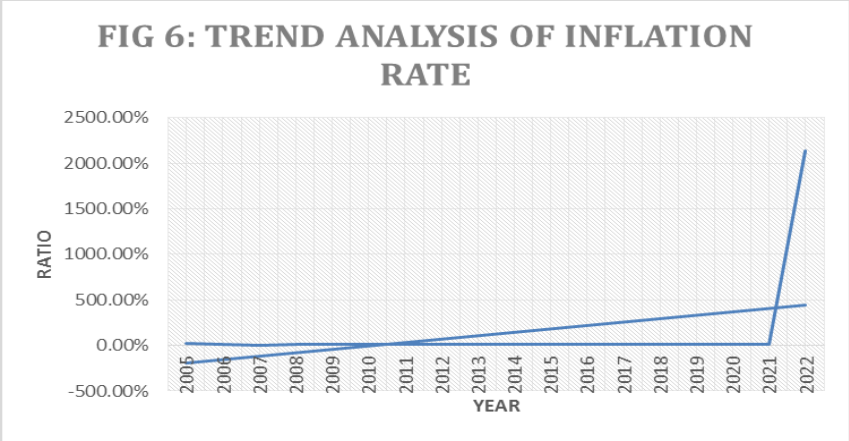
Source: Researcher's Extract from CBN (2023)

The above graph shows the trend of capital expenditure in Nigeria. From the graph above, it can be observed that capital expenditure was steady between year 2005 to 2006 has been fluctuating since then. This could be as a result of fuel subsidy expenditure by government.



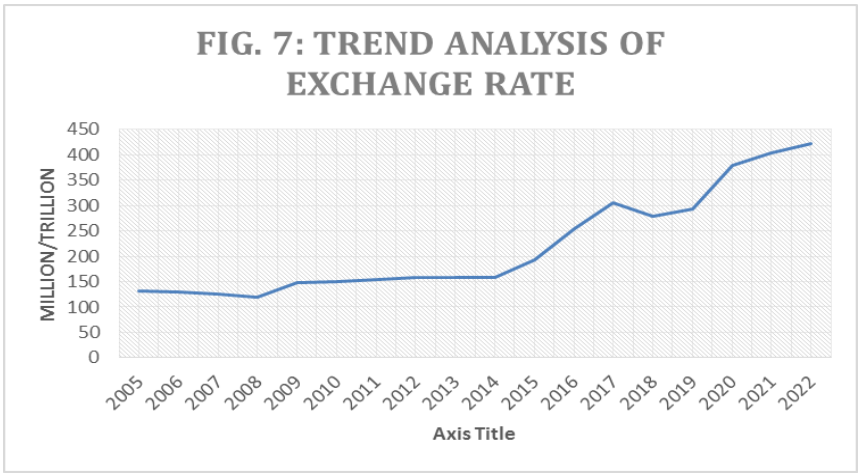
Source: Researcher's Extract from CBN (2023)

The above figure shows analysis of trend of multiple taxation in Nigeria. From the graph above, it can be observed that tax rate has been relatively steady from year 2000 to 2011 and has been on the increase since then. Fuel subsidy expenditure has an impact on the economic growth in Nigeria.



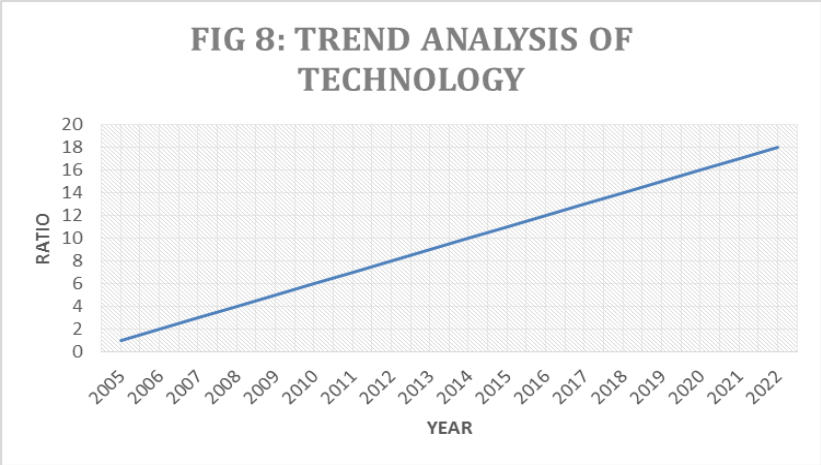
Source: Researcher's Extract from CBN (2023)

Analysis of the above graph shows pattern of inflation rate over a period of time in Nigeria. It can also be observed that there is a steady rise of inflation from 2005 to 2021. However, in 2022 there was a hyperinflation in Nigeria, this was as a result of fuel price increase. Fuel subsidy removal has an impact on the economy growth of Nigeria.



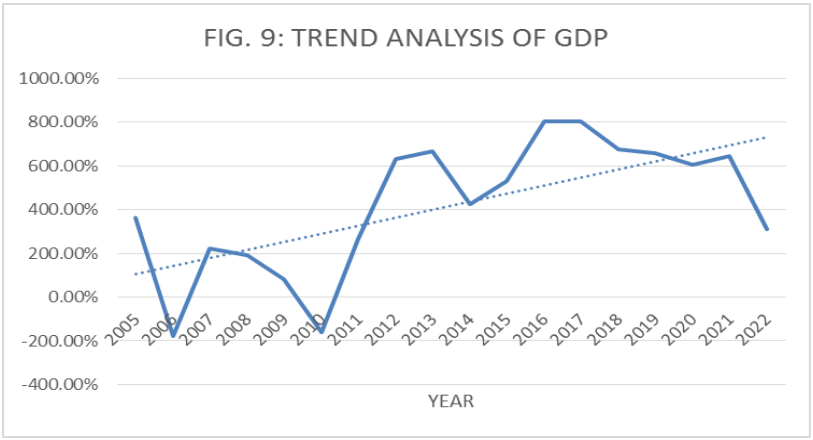
Source: Researcher's Extract from CBN (2023)

Analysis of the above graph shows pattern of exchange rate over a period of time in Nigeria. It shows inelasticity of Nigerian currency, it has been relatively increasing every year. This development has a negative impact on the economy growth in Nigeria.



Source: Researcher's Extract from CBN (2023)

Analysis of the above graph shows continuous growth pattern of technological innovation rate over a period of time in Nigeria. It can also be observed that there is constant rise and increase in technological innovation as well as an increase in economy growth in Nigeria.



Source: Researcher's Extract from CBN (2023)

Analysis of the above graph shows pattern of GDP over a period of time in Nigeria. It can also be observed that there is fluctuation in the GDP over the years, which is as a result of the fluctuation in fuel price in Nigeria.

Table 1: Stylised Fact of Fuel Subsidy Expended and Economy Performance Indicator 2005 to 2022

S/n	Years	FULE_ SUB	TR	REC_ EXP	CAP_ EXP	Tax	INFLA	EXR	TECH	GDP
1	2005	351	1,419.64	789.13	614.72	2.43	17.86	132.15	1	365.00
2	2006	257	1,543.77	894.32	583.98	2.44	8.23	128.65	2	365.00
3	2007	272	2,065.41	1,217.43	854.79	2.42	5.39	125.83	3	221.00
4	2008	631	2,934.84	1,505.63	1,455.70	2.45	11.58	118.57	4	192.00
5	2009	469	2,590.67	1,426.06	1,284.10	2.39	12.56	148.88	5	81.00
6	2010	664	3,162.54	1,648.40	1,522.40	2.52	13.72	150.3	6	181.00
7	2011	2110	3,410.10	2,055.70	1,375.20	2.25	10.84	153.86	7	265.00
8	2012	1360	3,572.52	1,664.40	1,965.30	2.78	12.22	157.5	8	631.00
9	2013	1320	3,905.38	1,948.43	1,890.41	1.71	8.48	157.31	9	667.00
10	2014	1220	3,672.03	2,120.48	1,865.52	3.85	8.06	158.55	10	423.00

11	2015	654	2,859.02	2,267.34	1,201.82	4.06	9.01	193.28	11	531.00
12	2016	240	2,467.70	2,007.74	1,201.82	3.96	15.68	253.5	12	801.00
13	2017	154	2,992.50	2,662.99	1,201.50	4.01	16.52	305.8	13	804.00
14	2018	1990	3,753.36	3,252.24	1,039.93	5.91	12.09	279.65	14	676.00
15	2019	508	3,636.51	3,283.10	1,207.36	4.96	11.40	292.73	15	659.00
16	2020	864	3,656.22	3,607.26	1,155.82	7.5	13.25	380	16	606.00
17	2021	1430	3,761.63	4,011.94	1,194.45	7.5	16.95	403	17	644.00
18	2022	1147	12.7	6.25	416.17	7.5	21.34	423	18	3.1

Source: Author's Computation from **SPSS**, 2023

KEYS:

FULE_SUB: fuel subsidy

TR: Total revenue

REC_EXP: recurrent expenditure

CAP_EXP: capital expenditure

Tax: taxation ration

INFLA: inflation rate

EXR: exchange rate

TECH: technology

GDP: gross domestic products

Table 2: Descriptive Statistics

Variables	FULE_SUB	TR	RE	CE	Tax	INFLA	EXR	TE	GDP
Mean	868.944	2856.4744	2020.4911	1223.9439	3.9244	1.2988	3962.56	171.0	75.35
Variance	358693.703	1076291.849	1085628.923	187370.606	3.860	25.017	10556.751	28.500	9.183
Maximum	2110.0	3905.38	4011.94	1965.30	7.50	21.34	423.00	18.0	8.04
Minimum	154.0	12.70	6.25	416.17	1.71	.05	118.57	1.0	-1.79
Std. Dev.	598.9104	1037.44487	1041.93518	432.86327	1.96468	5.00174	102.74605	5.3385	3.03029
Skewness	.750	-1.427	.212	-.051	.955	4.242	.899	.000	-.674
Kurtosis	-.369	1.971	-.192	-.196	-.407	17.998	-.611	-1.200	-.431
Sum	15641.0	51416.54	36368.84	22030.99	70.64	23.38	3962.56	171.0	75.35
Range	1956.0	3892.68	4005.69	1549.13	5.79	21.29	304.43	17.0	9.83
Observations	18	18	18	18	18	18	18	18	18

Source: Author's Computation, 2023.

A correlation analysis was performed to determine the significance and character of the association among the dependent variable, independent variable, and control variables. Regression analysis is the statistical method used to assess the relationships between independent and dependent variables. The regression equation can be employed to demonstrate the degree of correlation between two variables. The utilization of panel regression models is employed to establish the correlation between fuel subsidy and economic development by formulating regression equations.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.832[a]	.693	.478	432.7475	.693	3.223	7	10	.046	2.076

Upon analysis of Table 3, it is evident that the R-value obtained through computation is present. At a level of statistical significance of 0.000, it was observed that the value of 87 exceeded the R-value specified in the table, which was 0.0884. The R-squared value of 78% indicates that the predictive model is able to explain a substantial portion of the variability in the fuel subsidy expenditure and the economic performance indicator from 2005 to 2022, as presented in the aforementioned table. The data reveals a statistically significant positive correlation between government expenditure on fuel subsidies and the economy's performance indicator from 2005 to 2022. The identification of a

statistically significant discrepancy in the influence of each independent variable, as depicted in Table 3, held great significance.

Table 4: Analysis of variance of the difference in the influence exerted by each independent variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4225089.065	7	603584.152	3.223	.046[b]
	Residual	1872703.880	10	187270.388		
	Total	6097792.944	17			

Based on the findings reported in Table 4, the F-value acquired is 3.223. It is worth mentioning that the computed critical F-value (0.000 a) is below the predetermined significance level of 0.000, given the degrees of freedom of 7 and 10. The findings indicate a statistically significant correlation between the amount of fuel subsidy expenditure and the economic performance indicator from the years 2005 to 2022. The results of a coefficient analysis, aimed at assessing the impact of the independent variables, are presented in Table 4.

Table 5: Coefficient analysis of the influence of each of independent variable on the dependent variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1069.114	817.139		-1.308	.220		
	TR	1.849	.925	3.203	1.998	.074	.012	83.657
	REC_EXP	-.834	1.214	-1.451	-.687	.508	.007	145.294
	CAP_EXP	-1.595	1.085	-1.153	-1.470	.172	.050	20.014
	Tax	163.807	194.386	.537	.843	.419	.076	13.240
	INFLA	122.239	123.947	1.021	.986	.347	.029	34.889
	EXR	-1.646	5.632	-.282	-.292	.776	.033	30.395
	TECH	-15.399	102.052	-.137	-.151	.883	.037	26.944

Table 6: Correlations

Variables		FULE_SUB	TR	REC_EXP	CAP_EXP	Tax	INFLA	EXR	TECH	GDP
FULE_SUB	Pearson Correlation	1	.419	.291	.331	.244	.115	.176	.331	.196
	Sig. (2-tailed)		.083	.242	.180	.328	.649	.485	.179	.437
	N	18	18	18	18	18	18	18	18	18
TR	Pearson Correlation	.419	1	.797**	.783**	-.013	-.684**	-.034	.212	.417
	Sig. (2-tailed)	.083		.000	.000	.958	.002	.893	.398	.085
	N	18	18	18	18	18	18	18	18	18
REC_EXP	Pearson Correlation	.291	.797**	1	.320	.484*	-.481*	.466	.578*	.594**
	Sig. (2-tailed)	.242	.000		.196	.042	.043	.051	.012	.009
	N	18	18	18	18	18	18	18	18	18
CAP_EXP	Pearson Correlation	.331	.783**	.320	1	-.324	-.467	-.309	-.008	.243
	Sig. (2-tailed)	.180	.000	.196		.189	.051	.212	.974	.331
	N	18	18	18	18	18	18	18	18	18
Tax	Pearson Correlation	.244	-.013	.484*	-.324	1	.456	.945**	.876**	.425
	Sig. (2-tailed)	.328	.958	.042	.189		.057	.000	.000	.078
	N	18	18	18	18	18	18	18	18	18

INFLA	Pearson Correlation	.115	-.684**	-.481*	-.467	.456	1	.496*	.399	-.087
	Sig. (2-tailed)	.649	.002	.043	.051	.057		.036	.101	.731
	N	18	18	18	18	18	18	18	18	18
EXR	Pearson Correlation	.176	-.034	.466	-.309	.945**	.496*	1	.920**	.513*
	Sig. (2-tailed)	.485	.893	.051	.212	.000	.036		.000	.030
	N	18	18	18	18	18	18	18	18	18
TECH	Pearson Correlation	.331	.212	.578*	-.008	.876**	.399	.920**	1	.651**
	Sig. (2-tailed)	.179	.398	.012	.974	.000	.101	.000		.003
	N	18	18	18	18	18	18	18	18	18
GDP	Pearson Correlation	.196	.417	.594**	.243	.425	-.087	.513*	.651**	1
	Sig. (2-tailed)	.437	.085	.009	.331	.078	.731	.030	.003	
	N	18	18	18	18	18	18	18	18	18

The r-values obtained, which are presented in Table 6, represent the correlations between the independent and dependent variables. The statistical significance of the mentioned value was assessed by comparing it with the critical r-value (0.086) at a significance level of 0.025, while considering 17 degrees of freedom. A significant positive correlation has been identified between fuel subsidy (FUEL_SUB) and gross domestic product (GDP), as evidenced by a correlation coefficient of 0.196. Subsequently, the TR metric yielded a numerical value of 0.417, while the REC_EXP metric exhibited a noteworthy value of 0.954. The next metric, CAP_EXP, generated a numerical output of 0.243, whereas the tax metric produced a numerical output of 0.425. The observation of a noteworthy negative correlation (-0.087) between inflation and gross domestic product (GDP) is significant. The exchange rate (EXR) metric yielded a numerical output of 0.413, while the technology (TECH) metric resulted in a numerical output of 0.651. The limited representation of diverse perspectives in the available data pertaining to the government's stance may potentially exert an influence.

Conclusion

The elimination of fuel subsidies in Nigeria exerts substantial effects on the country's economic growth. Although the immediate outcomes may differ, the enduring impacts tend to be favorable.

Fuel subsidies impose a significant fiscal burden on government expenditures, thereby consuming a considerable proportion of the budgetary allocation. Through the elimination of these subsidies, the government possesses the ability to reallocate financial resources towards sectors that yield greater productivity, such as the advancement of infrastructure, enhancement of healthcare services, and improvement of educational systems. This policy measure facilitates the achievement of fiscal sustainability objectives and fosters a conducive atmosphere for the promotion of economic growth. The elimination of fuel subsidies enables the government to generate supplementary revenue by means of heightened taxation or the reallocation of funds saved from the subsidy. These funds have the potential to be utilized for the purpose of financing public investments, thereby fostering economic activities that can result in the creation of employment opportunities, enhanced productivity, and overall expansion of the economy.

While the elimination of fuel subsidies may initially give rise to short-term difficulties, such as temporary increases in prices and inflationary pressures, the overall effects on Nigeria's economic growth are predominantly favorable. The removal of fuel subsidies has the potential to enhance economic robustness and prosperity through the promotion of fiscal sustainability, attraction of foreign investment, diversification of the economy, and improvement of resource allocation. The implementation of complementary policies, such as social safety nets, by the government is of utmost importance in order to address and alleviate the potential negative consequences that may arise for vulnerable populations during the transition period.

Recommendations

Based on the aforementioned impacts, it is recommended by the researchers that the government should actively promote and incentivize investments in renewable energy sources, including but not limited to solar, wind, and hydroelectric power. This measure will effectively mitigate the nation's reliance on non-renewable energy sources and foster sustainable economic development in the foreseeable future.

The government ought to give precedence to the advancement of proficient transportation networks, encompassing roads, railways, and ports, in order to expedite the transportation of commodities and services. Enhanced infrastructure has the potential to mitigate transportation expenses, stimulate trade activities, and entice investments; consequently fostering economic expansion.It is imperative for the government to institute mechanisms that guarantee transparency and accountability in the utilization of funds derived from the elimination of fuel subsidies. This encompasses the implementation of comprehensive monitoring and evaluation systems to effectively monitor and assess the utilization of the redirected funds.

The establishment of transparency is crucial in fostering trust and confidence among various stakeholders, both domestic and international, thereby facilitating increased investment. Additionally, it is recommended that the government implement specific social safety net programs to extend assistance to vulnerable populations who may face negative consequences due to the elimination of fuel subsidies. Potential strategies to address these issues encompass the implementation of cash transfer programs, job training initiatives, as well as the provision of affordable healthcare and education opportunities. The promotion of inclusive benefits derived from economic growth is imperative for fostering social stability and facilitating sustainable development.

The allocation of government funds towards research and development (R&D) is imperative in order to stimulate innovation and foster technological progress across diverse industries. This initiative is expected to facilitate the emergence of novel industries, enhance productivity levels, and bolster Nigeria's competitive position in the international market.

It is recommended that the government prioritize skill development programs and educational initiatives to equip the workforce with the requisite knowledge and capabilities required for a diversified economy. The presence of a highly competent labor force has the potential to entice investment and stimulate economic expansion in industries other than the oil and gas sector.

Through the implementation of these recommendations, Nigeria has the potential to effectively utilize the favorable outcomes resulting from the removal of fuel subsidies, thereby establishing a conducive atmosphere for sustained economic expansion, diversification, and overall progress.

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