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Comparative Analysis of Fuel Subsidy Removal and the Diversification Policies for Agricultural Development in Nigeria

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Abstract: The ripple effects of the petrol crisis on the Nigerian economy is multi-faceted: price distortions, volatilities, dutch disease, corruption, and inefficiencies. This study takes a comparative analysis of fuel subsidy removal and the diversification policies for agricultural development in Nigerian. The study made use of secondary data obtained from Central Bank of Nigeria Statistical Bulletins, Petroleum Product Price Regulatory Agency (PPPRA), National Bureau of Statistics, Benue State Agricultural and Rural Development Authority (BNARDA), and FAO. Johansen co-integration model and t-test were the analytical tools used. After appropriate robustness checks and ensuring data stationarity, the study found that fuel subsidy removal had significant positive influence on the country's GDP, significantly reduced inflation rate, and also reduced life expectancy of Nigerians. Specifically, a percentage increase in petrol price significantly increases GDP by 9.8%; a percentage increase in petrol price increases the prices of rice and maize by 0.75% and 1.50% respectively when the retracted percentage is reinjected into the economy through other sectors say Agricultural. The study concludes that increased petrol price had negative effects on GDP in the short run and adverse effects on the prices of crop produce, but the result seems not find any negative relationship between GDP and crop production. This may be as a result of the reinjection of the subsidy retracted percentage back into the economy thereby causing a balance up in other sectors. Government should diversify and develop other economies and provide adequate infrastructural facilities to cushion the effects of subsidy removal. Organic and low-input methods of farming should be adopted to reduce the need for fuel inputs to the food system at all levels.

Keywords: Fuel, Inflation, diversification, Nigeria, Subsidy.

I. INTRODUCTION

Economic diversification has been regarded as a major tool and source of sustainable economic growth and development in developed, emerging and developing economies through direct effect on the GDP by increasing economic activities and indirectly through multiplier effect (Anyaehie & Areji, 2015; Akpan, 2009; Gachino, 2007). Classical and neo-classical economics theory projected convergence between poor developing countries and the developed countries in the long run due to transfer of technology and capital from the developed countries to the developing countries. One of the way capital and technology are transferred from developed countries to developing countries is through the inflow of foreign direct investment that can only be possible through economic diversification (Solow, 1956; Romer, 1990; Noko, 2016b). Economic diversification therefore becomes a necessity for sustained growth in developing countries that are largely dependent on the production, utilization and export of one particular type of product over time. Economic diversification entails strong and deliberate involvement in wide range of economic activities key to the growth and development of a nation. Diversification of an economy resolves economic recession (Noko, 2016a), unemployment problem (Hyden, 2006), reduce poverty (Suberu et al, 2015), and improves economic growth (Anyaehie & Areji, 2015). At independence, agriculture dominates the economic activities of Nigeria economy contributing about 85 per cent to foreign exchange earnings, 90 per cent to employment generation and contributing about 80 per cent to the country gross

domestic product (CBN, 2010). However, with the discovery of crude oil in commercial quantity, the agriculture sector was abandoned and neglected over time. Crude oil or mining sector became the principal driver of Nigeria economy; contributing over 80 per cent of Nigeria revenue, 95 percent of the country foreign exchange earnings among others exposing the economy to international oil price fluctuation and shocks making it impossible for the country not to witness economic recession whenever there is oil price glut in the international market (World Bank, 2015).

Agricultural Share: Agriculture sector contribution to the country revenue and foreign exchange earnings is abysmal and not encouraging and need urgent strategy that can accelerate the sector performance. Noko (2016a) noted that the major challenges facing these two sectors includes issue of high taxation or multiple taxation, high interest rate on loans, and the unchanging structure and method of production in the country since independence. In response to such assertion, the government has over the year developed several programmes aimed to improving the agriculture sector production and accelerating the manufacturing sector productivity over time. Majority of the programmes were introduced after the civil war in Nigeria (1967-1970) as measure of rebuilding the country. Among the leading policies introduced to accelerate agricultural productivity includes; National Accelerated Food Production project (NAFPP) in 1972, 'Nigeria Agricultural and Cooperative Bank' (NACB) in 1973, 'Operation Feed the Nation, (OFN) in 1976, 'Green revolution' in 1980. Other few programmes introduced includes 'Farm Settlement Scheme', 'Agricultural Development Projects (ADPs)', 'River Basin Development Authorities (RBDAs)', 'Nigerian Agricultural, cooperation and Rural Development Bank (NACRDB)', 'National Agricultural Land Development by farmer Authority (NALDA)' in 1989, 'State-wide Agricultural Development Projects (SADPs)' introduced in 1991 (Umaru et al, 2013; Ojo, 2008). And in 2016, the importation of rice and other 21 products were banned into the country to encourage rice production, which has spurred the production of more than 1.5 metric tonne of rice in 2017 alone (CBN, 2017).

Oil Share and Diversification: Oil revenue accounted for 9% of total federal government revenue in 2022 and the crude oil sector accounted for as low as 5.7% of Nigeria's Gross Domestic Product (GDP). Oil's contribution to revenue and GDP at single digit is a feature that is quite odd for an oil exporting country like Nigeria. With such low contribution, some political and economic leaders have argued that the Nigerian economy is now diversified; but is this really a diversification, or the kind of diversification that we should celebrate? Diversification, like any economic phenomenon, must be discussed in context. It has to do with shares or contribution of sectors to the economy whether in terms of output, revenue, employment and export. Because diversification deals with shares, once the value of say, sector A, decreases, the share of the sector B automatically increases, provided that the value of sector B remains the same, increases or falls marginally, relative to sector A.

Now, my argument is simple: the kind of diversification that Nigeria needs is one that increases the actual value of both the oil and the non-oil sectors, but where that of the non-oil sector rises rapidly and faster than that of the oil sector. This is the exact opposite of what we find in Nigeria's so-called diversification narrative especially when it comes to revenue. Just looking at the shares, i.e. the low contribution of oil to GDP and revenue, it is easy to argue that such an economy is diversified, but this argument does not tell the full story behind the falling value of the oil sector. However, I should say that many Nigerians have been sold a narrative that the economy is where it is today because of crude oil.

Some economists and analysts have argued in support of the resource curse hypothesis. But the fact is this – the problem with the Nigerian economy is not the commodity, because there are countries, whose realities, negate the resource curse argument. Particularly for Nigeria, we have (1) failed to significantly grow crude oil revenues even when oil prices are high (2) failed to save for the rainy day and (3) failed to use available crude oil revenue to develop critical areas of the economy, as some oil producing countries did or are doing.

At the moment, Nigeria is failing to get enough revenue from oil and gas. This is not something that we should celebrate, especially because our non-oil

sector is not growing fast enough to cover the budget and trade shortfalls, due to a large informal sector and lower productivity, occasioned by a challenging business environment.

1. Statement of the problem

Nigeria is not the only mono-cultural economy among emerging economies, but it appears to be the only one that rides on a circuit of oil reversal. This is the culture where successive governments bleed the natural resources, run down local refineries, operate off-shore refineries in a circuit and engage in massive refined products importation in a cartel-like fashion and never want to look away from, or to explore the potentials in other sectors. And worst still, the few available foreign exchange is wasted through a racket called oil subsidy which is a rent seeking patronage system organized to sustain those who tout to hold the levers of power (Ani et al., 2014). The assumption is that deregulation and removal of subsidy and having the withdrawal injected back to revitalize other sectors as a way of diversification may help the economy, although this may initially lead to inflationary pressures but as the market is opened up to investors, billions of dollars will flow into the downstream sector and more refineries will open for business in Nigeria. Eventually, the market will self-regulate prices for refined petroleum products and other goods and services will be at the natural market level as competition forces down price. Consequently, the long-term benefits will be more than the short-term pain. The government has lost billions of Naira of oil revenue due to the falling price of oil, but it has also saved billions of Naira due to the reduction in subsidy claims as a result of the drop in international market price of petroleum products yet never considered to inject it to improve other sectors. However, it should be noted that there were obvious flaws in the policy of subsidy removal at inception and up to January 1, 2012 when it was partially removed (Iyobhebhe, 2012), and now completely by the present regime of the Asiwaju Bola Tinibu which effect is presently hitting the country hard and ranges from high production cost that translates to direct high prices of goods and services, high cost of farm implements and transportation that will certainly reflect in low agricultural production through the following gaps:

1. There were more private retailers of petroleum products than the State-owned NNPC stations.
2. The regulatory framework (PPPRA) used to enforce the subsidy was weak, under-resourced and suffered from the 'Nigerian disease'. The secrecy and lack of transparency by the administrator of the subsidy (the NNPC) might not help matters either.
3. Nigeria still could not make her refineries efficient to drive the economy. And with subsidy removal, rather than effecting and affecting the diversification policies in place positively, there appears to pose counter effects on the other sectors.

This means that Nigeria could not produce enough refined products for local consumption. Bacon and Kojima (2006), reported that subsidies have had unintended consequences in the thirty- eight developing countries studied, such as fuel adulteration, smuggling, and benefits that go mostly to the better-off. Amegashie (2006) argued that removal of subsidies on petroleum products as prescribed by the World Bank to developing countries would have adverse effects on the poor in these countries, while Baig et al., (2007) investigated recent developments in the pass-through of international to domestic petroleum product prices in the different fuel pricing regimes, and in fuel subsidies in developing economies. They argued that there is limited price pass-through in many countries and the consequent increase in fuel subsidies. Finally, the effect of subsidy removal (partial or complete) will greatly affect the prices of agricultural product of the economy because a large numbers of farmers in Nigeria are rural dwellers, whose production and marketing of their produce depends on petroleum. The farmers will suffer greatly in the face of fuel subsidy removal thereby leading to serious decline in agricultural production in the country due to high cost of farm inputs and cost of transportation to urban center to buy the farm inputs. While Bloom and Sachs (1998), Gallup, Sachs and Mellinger (1999), Bloom, Canning and Sevilla (2002), Lorentzen, McMillan and Wacziarg (2008) found large effects of increasing life expectancy on subsidization of oil; a recent paper by Acemoglu and Johnson (2007) found little effect. Sekunmade (2009) estimating the effects and extent of petroleum dependence (in terms of oil exploration, production and trade) on the

agricultural sector focusing on export crops found that the quantity of oil production had an inverse relationship with the output of agricultural crops. Adebisi (2012) stated that Dutch Disease (which is a situation in which a country's seeming good fortune proves ultimately to have a detrimental effect on its economy), occurs when a country discovers a substantial natural resource deposit and begins a large-scale exportation of it. As a result, the country's currency appreciates, thereby reducing the competitiveness of the country's traditional export sector. Therefore, this tradable goods sector should contract, leading to structural changes in the economy. His study examined whether Dutch Disease was present in Nigeria in the light of the rejection of the Dutch Disease thesis in other studies. Arinze (2011) asserted that upward adjustment of petroleum products prices have resulted in inflation, high cost of living and inequitable distribution of income in Nigeria. His study revealed that whenever petroleum prices increases, the inflation rate also increases. The explanation of their research was that the relationship between the inflation and the price of petrol is significant. Isyaka (2014), found that price increase of PMS does not lead to increase in cost of distribution of other commodities including agricultural products. They also found that constant increase in price of PMS has a negative impact on employment generation; it also leds to high rate of inflation over the years. A search through the literature shows that limited researches were conducted along the effect of fuel subsidy removal and particularly, complete removal on Nigeria's GDP, inflation rate, life expectancy and prices of some agricultural produce, hence the need for this study.

2. Research Objectives

This study shall be guided by the following objectives of the study;

1 To investigate the impact of fuel subsidy removal on agricultural development in Nigeria

2. To investigate the role of fuel subsidy removal in economic diversification policies for agricultural development in Nigeria.

3. To examine the role of agricultural and oil price on the economic growth of Nigeria.

3. Research Questions

From the forgoing, the following research questions are germane;

1. What are the effects of fuel subsidy removal on agricultural policies and development

2. Does the fuel subsidy removal directly translate to economic diversification policies for agricultural development

3. How are the diversification policies in the face of fuel subsidy removal policy in Nigeria today.

4. Research Hypothesis

HO1: Fuel subsidy removal has no impact on agricultural development and the economy of Nigeria

HO2: Fuel subsidy removal has inverse relationship with diversification policies for agricultural development in Nigeria

HO3: Fuel subsidy removal does not affect diversification policies in Nigeria

5. Study Area

The study area is Nigeria. There are 36 States in Nigeria with Abuja as the Federal Capital Territory and 774 Local Government Areas. Along the geopolitical line, the country is divided into six geo political zones namely; North West, North East, North Central, South -South, South West and South East. According to the 2006 population census, Nigeria has a population of 140,431,790 (NPC, 2006), with an estimated population of 200,000,000 people in 2018, being the most populous country in Africa. Nigeria has a total land area of 923,768km2 being the world's 32nd-largest country (Eboh, Orji, Amakom & Uja, 2004). The country is richly endowed with abundant natural, human and material resources, the prominent natural resource being crude oil, hence Nigeria is ranked the 12th largest producer of crude oil in the world and the 8th largest exporter, and has the 10th largest proven reserves (Ajakaiye, 1993).

6. Scope of the Study

The study made use of the monthly macroeconomic data in Nigeria to cover the period between January, 2006-2023 (a period of 17 years) which is significant enough to make a forecast by the policy makers

7. Significance of the Study

This study, when completed will not only add to the

body of knowledge and the footing for further researches and policy formulation strategy in Nigeria, but when completed would have formed the solution to the present problem of the circuit of oil reversal and negligence to cohesive economic sectors co-integration to achieve general equilibrium for both national and international economic free sailing among global economies of the world.

II LITERATURE REVIEW

This section reviews on some other related materials, concept, theories, empirical frameworks on the said topic. All related materials are sought independently and as pertains their relevancies. To conceptual framework are: different ideas and perception of scholars who attempted to look at the same or nearly close to the same topic based on their standpoints and largely be influenced by the factors peculiar to them as regards the topic; as regards theoretical framework: are preponements found to be proven and legible to draw inferences in a similar scenario(s) and empirical framework are the scientifically used of correct models that has given a desired result on a similar matter. This chapter also, reveals the gap in the existing body of knowledge that seeks to be resolved by this study.

1. Conceptual Framework

Fuel Subsidy Removal: The Nigerian economy over the years has been programmed to revolve around the supply of cheap petroleum products. An average household in Nigeria depends on subsidized by-products of crude oil such as petrol and kerosene for domestic and commercial use. This dependence is not helped either as public electricity supply from power holding company (PHCN) is epileptic. Almost every home and business is powered by generators through subsidized petrol. The few small scale business such as hotels, barbers, welders, farmers, hair dressers, pepper sellers, private and government hospitals etc., all rely on subsidized fuel. Gasoline, Premium Motor Spirit (PMS) or fuel as it is normally called in Nigeria is the second most used product after food in Nigeria. Whenever the price of fuel goes up, other sectors of the economy are affected. This is because transport cost for providing essential services goes up and it creates multiplier effect in the economy, the ripples are felt even up to the rural areas. The movement of agricultural product from one place to another depends on the transport sub-sector; causing a raise in the prices of product and services in the society, especially in the market. Key component of basic needs indicators such as food, housing, clothing and health will be affected, as access to them becomes costly. Nigeria having an average of 53.2 years as life expectancy and world ranking life expectancy of 175 according to WHO (2011), with the removal of fuel subsidy, life expectancy may be reduced due to high cost of health services, transportation and even food requirement of the people.

The frequent and incessant price changes (price hike) of petroleum products in Nigeria has been a source of worry, contention and many a time controversy. Petroleum products prices are arbitrarily increased several times, in a short period and each government has given flimsy reasons for the upward adjustment (Dike, 2003). The problem could be traced to the inefficiencies of the nation's refineries in addition to the sabotage from bunkerers, oil spillagers and attitude of some marketers. The effect of this on the nation's economy is constant fuel supply disruptions leading to both economic and environmental problems. It is a fact that during the fuel shortages, the economic and administrative life of a nation becomes disturbed and almost disrupted. Motorists spent hours, sometimes days queuing at the filling stations. Most motor parks are empty; offices were closed as people moved out in search of fuel. There is no doubt that the removal of fuel subsidy poses a serious threat to food security and development of the nation (FAO, 2012). According to Dangote, the removal of petroleum fuel subsidy is also critical because it benefits the more affluent, which is a small minority of the population (Janet, 2015).

Subsidy in economic sense exists when consumers of a given commodity are assisted by the government to pay less than the prevailing market price of same. In respect of fuel subsidy, it means that consumer would pay less than the pump price per litre of petroleum products. On the other hand, fuel subsidy could be described as the difference between the actual market prices of petroleum products per liter and what the final consumers are paying for the same products. While over the years, many Nigerians have opposed the implementation of the policy in the Oil and Gas industry, international finance and donor agencies like the World Bank and IMF have been very harsh in their criticism of the successive governments that have sustained the fuel subsidy policy for a single inherent flaw they condemned as harmful to the growth of the Nigerian economy (Iba, 2012). Attempts to remove subsidies have generated oppositions from consumers already used to cheap energy prices due to presumptions that any price increase will fuel inflation and reduce economic welfare. In spite of cumulative efforts by successive governments, oil subsidy remains one of the most intricate socio-economic policy issues in Nigeria. Since 2010, there have been attempts by different governments to remove subsidy in the oil sector by gradually withdrawing its subsidy and increasing the prices of petroleum products. The discourse on fuel subsidy has been on the front burner and couldn't be fully resolved. In December 2015, after many years of providing fuel subsidy – also known as the Petroleum Support Fund (PSF) – the Nigerian government

announced a withdrawal of the fund. The reason given was that the government could no longer afford the payment due to a dip in the country's revenue, caused by the huge drop in crude oil prices at the international market. At the time, the subsidy withdrawal led to no increase in the pump or retail price of petrol at local stations, only because oil prices in the international market had fallen so low that the full economic cost of supplying a litre of petrol was lower than local retail price, which I called the partial removal.

However, in more recent times, oil prices at the international market are beginning to rise once again, putting familiar upward pressures on unregulated local retail price of petrol. In April 2016, with the intention of soaking up these inflationary pressures and keeping pump price of petrol at its current level of 186.50 Naira per litre (save for those despicable and unscrupulous marketers selling theirs at unimaginably higher rates), the government announced the return of the subsidy. This indecision surrounding the subsidy issue has been a recurring theme for a long time. This study therefore examines the subsidy issue through the lens of economic diversification, and agricultural development and proposes a number of options to address the issue once and for all.

And even before or after the partial form of subsidy removal by gradual withdrawal since 2011 during Goodluck Ebele Jonathan in the history of Nigeria, there has never the likes of hype in oil price until recently when announced of its total removal by the present government of Asiwaju Bola Tinubu during his inaugural speech on the very night of his swearing in being 29th May, 2023 causes oil price to rise to its present state which indicates the reality of the subsidy withdrawal.

The link between agriculture and oil is quite obvious: the current global food system is highly fuel and transport-dependent. Fuels will almost certainly become less affordable in the near and medium term, making the current, highly fuel-dependent agricultural production system less secure and food less affordable. Modern agriculture uses oil products to fuel farm machinery; transport other inputs to the farm, and transport farm output to the ultimate consumer. Oil is often also used as input in agricultural chemicals. Oil price increases therefore put pressure on all these aspects of commercial food systems. Moreover, as oil prices rise, so does demand for biofuels, which are the only non-fossil liquid fuels able to replace petroleum products in existing combustion engines and motor vehicles. But biofuels are often made from corn and other agricultural products. As demand for these alternative fuels increases, crop prices are forced upwards, making food even less affordable. Oil subsidy has moved from being an implicit subsidy to explicit cost. Fuel subsidy has increased significantly over the years, especially with rising share of imports in domestic supply. According to Adenikinju (2006), in 2006 it was ₦261.1 Billion (US$2.03 Billion) or 1.4% of GDP while it rose to ₦278.9 Billion (US$2.3 Billion) in 2007 or 1.3% of GDP. Again, the subsidy level nearly tripled to N633.2billion in 2008 (US5.37 billion) due mainly to rising oil price and depreciating exchange rate. Subsidy according to Adenikinju (2006), has resulted in substantial loss of revenue and an exponential growth in domestic oil consumption as low price does not signal real cost of consumption, contributed to the collapse of local refineries as price of fuel did not reflect cost of supply, dilapidated supply and distribution infrastructures, reluctance of private investors to invest in refineries, sporadic fuel shortages at fuel stations, smuggling and adulteration of products. Thus, the broad objective of this study is to assess the effect of petrol prices (with eras of subsidy and partial subsidy to complete subsidy removal as exogenous (dummy) variable) on the agricultural sector and the Nigerian economy at large.

2. Diversification:

Diversification refers to a strategic direction that takes companies into other products and/or markets by means of either internal or external development. There are basically two broad forms of diversification as listed below:

Related diversification: This occurs when a company develops beyond its present product and market whilst remaining in the same area.

Backward diversification: This is when activities related to the inputs in the business are developed. Forward diversification: This refers to development into activities which are concerned with a company's output.

Horizontal diversification: This occurs when a company develops interests complementary to its current activities. For a company may integrate its activities to include all aspect of the value chain; design, manufacture, market and distribute.

3. Agricultural Policies in Nigeria:

Agricultural policies and programmes in the colonial era.

The potential of agriculture for propelling Nigeria's economic development was recognized by the colonial government when policies were put in place to encourage output growth and to extract the surpluses there from (Aigbokhan, 2001). The predominant theme of development in this period was the surplus extraction philosophy or policy whereby immense products were generated from the rural areas to satisfy the demand for raw materials in metropolitan Britain (Ayoola, 2001). This early interest of the extraction policy was on forest resources and agricultural exports like cocoa, coffee, rubber, groundnut, oil palm etc. Some of the programs are as follows:

Farm Settlement Scheme (FSS) This was initiated by some regional governments in Nigeria and was a critical element of Western Nigeria Policy of Agricultural and Natural Resources of 1959. The main objective of this scheme was to settle young school leavers in a specified

area of land, making farming their career thereby preventing them from moving to the urban areas in search of white collar jobs. These settled farmers were also to serve as models in good farming systems for farmers residing in nearby villages to emulate. Unfortunately, the dream of this scheme was not materialized because some of the settlers were too young and inexperienced in farming thus causing a high percentage of drop-outs among the settlers (Amalu, 1998). Secondly lack of understanding of the meaning and implication of the scheme by some settlers who assumed that through their participation in the scheme they would eventually get paid job. They were discouraged and some withdrew as soon as the allowances were not given any more. Thirdly, the cost of establishing a viable farm settlement was too high in terms of cash and staff (Amalu, 1998). Finally, expenses made on the scheme was incurred mainly on installation of infrastructure like construction of houses, schools, markets, roads etc for the settlers which did not directly bring about increase in agricultural output by the participants as targeted.

Agricultural policies and programmes in post colonial era From independence (1st October 1960) to 15th January 1966. New policies were formulated in the post-independence era to actualize more equitable growth in agriculture.

National Accelerated Food Production Programme (NAFPP) National Accelerated Food Production Programme (NAFPP) was an agricultural extension programme initiated in 1972 by the Federal Department of Agriculture during General Yakubu Gowon's regime. The programme focused on bringing about a significant increase in the production of maize, cassava, rice and wheat in the northern states through subsistent production within a short period of time. The programme was designed to spread to other states in the country after the pilot stage that was established in Anambra, Imo, Ondo, Oyo, Ogun, Benue, Plateau and Kano states. Mini –kit, production-kit and mass adoption phases were the three phases of the programme. Lapses found in the programme included:

- Farmers sponsored (financially) the last two phases of the programme. This discouraged some farmers from participathing in the programme.
- Farmers who could not form co-operatives were likely to be left out in the programme since the programme relied on disbursement of credits and farm inputs through co-operative societies.
- Abrupt/premature withdrawal of funding by the Federal Government due to the introduction of another programme termed Operation Feed the Nation.
- Demonstration trials were done on some selected farmers' plots by the research and extension personnel which did not give a true/good representation of the outcome of the technology or programme . In other words, it lacked farmers participation.

4. Agricultural Development Projects (ADP)

ADP formerly known as Integrated Agricultural Development Projects (IADP) was earlier established in 1974 in the North East (Funtua), North west (Gusau) and North Central (Gombe) states as pilot schemes. The earlier impressive result of the programme led to its replication in 1989 to the entire then nineteen states of the Federation. This approach to agricultural and rural development was based on collaborative efforts and tripartite arrangement of the federal government, state government and World Bank (Amalu, 1998). Today this has grown to become the major agricultural and rural development programme existing in states in Nigeria. The important features of the programme are reliance on the small scale farmers as the main people that will bring about increase in food production and the feedback information mechanism which is a decentralized decision making process that allows farm families/households to give their responses to an innovation/technology, incentive, subsidies etc according to their judgment. The objectives of the programme are to bring about solution to the decrease found in agricultural productivity by sustaining domestic food supply, through massive infusion of world bank funds, the ADPs were established to provide extension services, technical input support and rural infrastructure (Ayoola, 2001) to the farmers/rural dwellers. Some problems that occurred in the course of executing the projects were; Shortage of fund due to decline in oil prices that started in 1982 which led to delays in recruiting competent staff and provision or purchasing of materials and facilities needed for the projects take off. This made implementation much slower than scheduled. Secondly, ADP emphasizes more on modern/ high input technology like sole cropping while majority of the farmers practiced mixed/relay cropping. There was also untimeliness of subsidized input supply for the programme. Present problems of ADP include: high frequency of labour mobility, limited involvement of input agencies, dwindling funding policies and counterpart funding, intricacies of technology transfer etc.

5. Operation Feed the Nation (OFN)

This programme evolved on 21st May 1976 under the military regime of General Olusegun Obasanjo. The programme was launched in order to bring about increased food production in the entire nation through the active involvement and participation of everybody in every discipline thereby making every person to be capable of partly or wholly feeding him or herself. Under this programme every available piece of land in urban, sub-urban and rural areas was meant to be planted while government provided inputs and subsidies (like agrochemicals, fertilizers, improved variety of seed/seedlings, day olds chicks, matchets, sickle, hoes etc)

freely to government establishments. Individuals received these inputs at a subsidized rate. The failure of the programme can be attributed to:

- Farming was done on any available piece of land irrespective of its suitability for agriculture.
- Majority of the participants in the programme had little or no farming background and there was no formal or informal preparatory teaching or advice given to them on how to manage their farms.
- They practiced mono cropping instead of mixed/ relay cropping and relied on hired labour to carry out their farming activities, which resulted in high input and low output /yield per unit of land.
- Preference was given to government establishments and individuals in authority/administration over the poor farmers (real producer of food) in terms of input supply.
- There was abundance of food in the market and less demand for the food because many people produced part or almost whole food they consumed.

6. River Basin Development Authorities (RBDAs)

River Basin Development Decree was promulgated in 1976 to establish eleven River Basin Development Authorities (RBDAs) (Decree 25 of 1976) (Ayoola, 2001). The initial aim of the authorities was to boost economic potentials of the existing water bodies particularly irrigation and fishery with hydroelectric power generation and domestic water supply as secondary objectives. The objective of the programme was later extended to other areas most importantly to production and rural infrastructural development. Problems found in the programme were: a number of the authorities grew out of proportion and the operations of some suffered from intensive political interference. Also ,substantial public funds were wasted to streamline sizes and functions of RBDAs through the disposal of their non-water assets.

III. EMPIRICAL LITERATURE REVIEW

This section took to consider some review on works done by others and their findings in the related topic, which can serve as a measure to determine what are the correlations with present study and what are the gaps or things lacking in the previous study that can be added this time around to ensure a more reliable and better result as knowledge increases.

1. Economic Diversification in Nigeria: Trends and Patterns

The pattern of trade in Nigeria shows an over reliance on oil production and export from 1970 after the discovery of crude oil in commercial quantities. But before then, the Nigerian economy was built on a diversified agricultural sector consisting of fishing, rearing of livestock, cultivation of land and forestry. Figures 1 and 2 shows the shifts in value added and employment across the different sectors. Most of the development plans in Nigeria failed because the economy was dominated by oil and gas whose price and productivity was externally determined (Metu, Nwogwugwu & Okeyika 2019).).

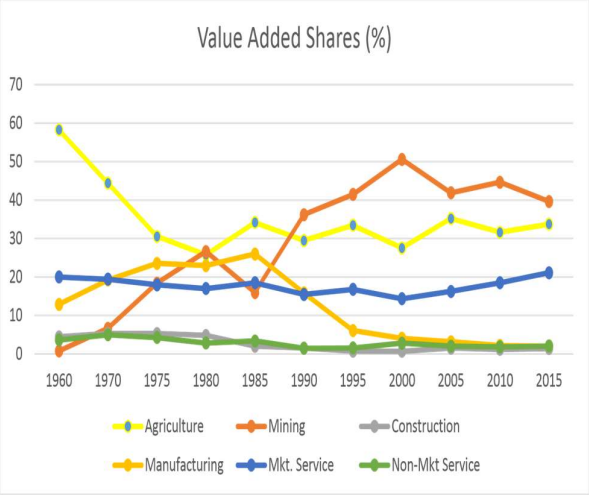

Fig 1. Value added shares in different selected sectors in Nigeria, 1960-2015.

Before Nigeria got her independence in 1960, the agricultural sector accounted for over 75% of foreign exchange earnings in the country, 68% of GDP and more than 75% of employment opportunities in Nigeria. Fig. 1 shows that after independence in 1960 with income from oil revenue, the share of agriculture to GDP started declining and contributed about 56.4% of GDP in 1962 but it dropped to as low as about 28% in 1976 only to pick up again to 42.2% in 1994. In the 1970s, due to oil boom, agriculture was neglected and oil exploration became dominant as the new commodity of comparative advantage. After 1970, the share of agriculture to aggregate GDP started to decline. Money flowed into the country's treasury and even when revenue from the agricultural sector dwindled nothing changed. The growth of the oil sector led to the development of the industrial sector. The industrial sector took the lead in contributing to GDP from 1974 to early 2000 and brought about

employment of foreign capital in the domestic production of goods and services. The share of mining subsector to GDP was 28% in 1974, while manufacturing share also increased to 20% during the same period. In 1980, oil prices dropped drastically and caused stagnation of the Nigerian economy. In 1986 the Structural Adjustment Programme was introduced as a short term measure to restructure and diversify the productive base and reduce overdependence on the oil sector and importation of goods and services. For the first few years, agriculture flourished once again and GDP rose to almost 35%. Though SAP was not beneficial to all especially the middle class, Naira depreciated to 80% to the U.S. dollar while the country's debt profile increased to almost half of government expenditure. Due to changes in the economy, the five year plans were replaced with 3 year rolling plan. The First Rolling Plan was from 1989 – 1991 which was revised into the Second rolling plan of 1990 – 1992. The rolling plans were to reduce inflation and achieve self-sufficiency (Ihonvbere, 1991). But this was not achieved because the share of manufacturing to aggregate GDP declined from to 29% in 1983 to 19% in 1987. This is in contrast to what obtained in Asian countries where the manufactu29% in 1983 ring share in value-added held up to above 25% of GDP. Deindustrialization in terms of fall in the share of GDP was witnessed at the period.

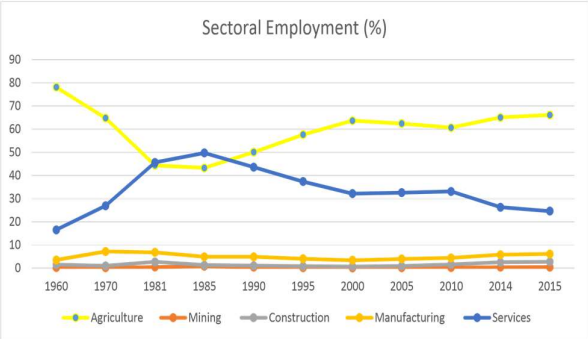

Fig.2. Employment shares in different selected sectors in Nigeria, 1960 -2015.

Source: CBN, (2009, 2018) In figure 2, the employment pattern is striking. In 1960s, about less than 4% of the Nigerian labour force was employed in the manufacturing subsector while almost 78% were employed in the agricultural sector. This means that the agricultural sector contributed more to GDP and also employed more labour force during the period. But the decline of government interest in the agricultural sector pushed workers out of agriculture and were absorbed in the informal sector. The agricultural employment share fell from 78% in 1960 to 44% in 1981 and picked again in early 1990s. At this period the market services in trade and distribution expanded employment in the services sector. Though the expansion in employment was not matched by expansion in output. 0 10 20 30 40 50 60 70 80 90 1960 1970 1981 1985 1990 1995 2000 2005 2010 2014 2015 Sectoral Employment (%) Agriculture Mining Construction Manufacturing Services

Table 1 Contributions of Nigeria's Oil and Non-Oil Sectors to Export (1970 -2016).

Years		Export		
	Oil Export		Non-oil export	
	Nominal Value (₦ billions)	% of Total	Nominal Value (₦ billions)	% of Total
1960	0.009	2.7	0.33	97.3
1970	0.51	57.3	0.38	42.7
1980	13.63	96.1	0.55	3.9
1990	106.6	97	3.3	3
2000	1,920.9	98.7	24.8	1.3
2010	11,300.5	94.1	711.0	5.9
2015	8,184.5	92.5	660.7	7.5
2016	8,178.8	92.6	656.8	7.4

Source: CBN, (2009, 2018)

Table 1 shows that the contribution of the oil-and non-oil export were 2.7% and 97.3% respectively in 1960 supporting the claim that the economy was not oil dependent in the 1960s. The pattern changed in the late 60s due to the commercial exploration of crude oil. By 1970, crude oil export increased to 57.3% from as low as 2.7% in 1960. This trend has continued till recent time as crude oil export stood

at 96.2% in 2016 while non-oil export was below 8% at the period. The Nigerian economy was more diversified when non-oil sector such as the services sector, building and construction, wholesale and retail trade recorded their highest (43%) share to GDP. Even though there was some elements of diversification in the late 1990s, the economy was still dominated by oil and gas and agriculture. A look at the overall trend shows that GDP has slowed down, driven by lower oil sector and a weaker non-oil sector. Some of the challenges for the slow growth can be attributed to lack of liquidity, devaluation that causes increase in the price of imports, tight monetary policy resulting in high interest rate and structural constraints.

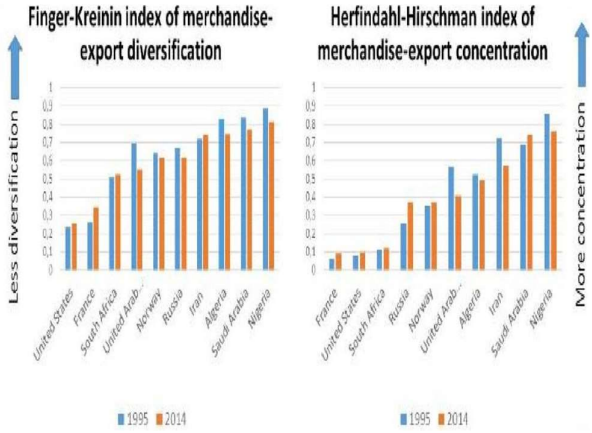

Fig. 3. Economic diversification and export concentration in 1995 and 2014.

Figure 3 shows the extent of diversification and concentration using both Finger-Krein Index of diversification and Herfindahl-Hirschman Index of concentration. The HefindahlHrishman export concentration index gives an indication of the extent of a country's export product concentration. For instance, in comparison to other countries, Nigerian economy is less diversified than the US, France, South Africa and other oil producing economies such as Iran, Saudi-Arabia and Algeria. When compared with 21 top African economies, Figure 4 +shows that Nigeria is not just ranked worst in diversification but has not recorded any significant improvement in diversifying the economy within the study period. Study conducted by Dorothy Patience Ani et al (2021) from University of Agriculture, Makurdi on partial subsidy removal shows that one cointegrating relationship exists among GDP, petrol prices, inflation and life expectancy (food and welfare). Thus, a long-run equilibrium relationship existed among them. Her result agrees with the findings of Gunu and Kilishi (2010), who found that oil prices had significant impact on three macroeconomic variables: Real GDP, money supply and unemployment. Similarly, Aliyu (2009), found in his long-run analysis, that a 10 percent increase in crude oil prices increased the real GDP by 7.72 percent. Also, Ebele and Iorember (2015), found that a unit increase in the oil price changes leads to 3.47 dollar increase in the Nation's non-oil GDP. The positive and significant impact of oil price changes on the non-oil GDP is due largely to the fact that oil revenue generated by the sales of the Nigerian Bonny-Light (Nigerian crude oil) enters back into the economy through public spending and drives other non -oil sectors of the economy. Ogundipe and Ogundipe (2014), in their study, the impact of oil price changes on investment in Nigeria, found that oil price changes do not have a direct impact on real GDP, but it influences other variables that significantly influence real GDP like investment and savings. Oil price significantly affect economic growth in all the estimations at conventional levels. This is due to the fact that higher oil prices translate to higher revenue/income for the economy which provides additional resources that can be used to promote economic growth. However, the results above, disagree with the findings of Ani et al., (2014) who discovered a positive but insignificant relationship between oil prices and the Nigerian's GDP. They found that oil price and Nigeria's GDP were not significantly related. This agrees with previous studies of Apere and Ijeoma (2013), who found no significant relationship between oil prices and GDP in Nigeria.

2. THEORITICAL FRAMEWORK

This section attempts to take recourse on some propounded theories that support the study. Theories are ideas of people intended to explain something or a phenomenon, especially based on general principles and independent of the thing to be explained. Theories serve as the foundation for further research and analysis. In this study, it provides the framework for understanding the relationships between different variables and helps

to make sense of the observations and data presented.

Exhaustible Resources Theory: This study is rooted in exhaustible resource theory (Hotelling, 1931). This theory was propounded by Hotelling in 1931. He advocated the need to price oil and other fossil resources in a way that recognizes the temporariness of their availability. According to this theory, the price becomes a user cost or depletion charges which compensate for the fact that future generation are denied access to the commodity. This price may or may not be consistent with the equilibrium outcome of demand and supply. Similarly, according to the derived demand theory proposed by Marshall, the demand schedule for any factor of production of a final product can be driven from the final product, assuming an unchanged demand schedule for a final product and given supply prices for other factors of production. The supply increase of any factor, other factors held constant and increase in the demand of the final goods would lead to an increase in the demand of a given factor of production. Blomberg and Harris (1995) agree that supply shock (or distribution problem) will lead to higher price impacts when the derived demand is inelastic.

Structural Transformation Theory: This theory emphasizes the need for countries to shift from dependence on a single industry or sector to a more diversified and balanced economy. It argues that diversification can lead to increased resilience, reduced vulnerability to external shocks, and long-term sustainable growth. This theory is also called structural change theory. William Lewis Arthur propounded the theory. Lewis was born on January 23, 1915 in the West Indies. In 1979 he was named a Nobel Prize winner in Economics. This was in recognition of his works on economic development and in particular developing a model on trade between developed and the less developed countries in relation to labor and productivity in agriculture. ("The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 1979,"). Between 1957-1963, he served as an Economic Adviser to the Prime Minister of Ghana, Dr. Kwame Nkrumah. In the late 1970s, there were visible changes in the socio -political world order. This led to a lot of interest in issues of structural changes. Structural change theories primarily focused on the mechanism by which underdeveloped economies transform their domestic economic structures from a heavy emphasis on traditional subsistence agriculture to a more modern, more urbanized and more industrially diverse manufacturing and service economy. (Moshe Syrquin, 1988). Arthur Lewis has contributed greatly to the discussions on Structural Change. His theory, the Arthur Lewis Structural Change theory tries to explain the growth of a developing country in terms of labor transition between two sectors. As a result of this, his theory is sometimes also called the dual economic theory. It focuses on labor being transferred between 2 sectors.

The Agricultural Sector This sector is also sometimes referred to as the subsistence, traditional or indigenes sector. In this sector, land is limited and mainly has to do with agricultural produces such as crops, grains, etc. There is an unlimited supply of labor with low or sometimes even zero marginal productivity of additional labor. Wage at this level is rated at the subsistence level. The Agricultural Sector: This sector is also sometimes referred to as the subsistence, traditional or indigenes sector. In this sector, land is limited and mainly has to do with agricultural produces such as crops, grains, etc. There is an unlimited supply of labour with low or sometimes even zero marginal productivity of additional labour. Wage at this level is rated at the subsistence level.

The Industrial Sector The modern, manufacturing or industrial sector on the other hand is said to be expansionary in nature. It is growing in nature. The main motive in this sector is to maximise profit by charging a price higher than the set wages. It focuses on more profits and higher wages. The wage that is provided under this sector is higher than what is provided in the agricultural sector. As a result, it serves as an incentive for the labour to migrate from the agricultural sector to the industrial sector. Structural Change therefore sees economic development as a set of interrelated structural changes. This mainly has to do with the move from being an under developedcountry to a developed country. This requires a set of structural changes to

sustain a continuing increase in income and social welfare" (Chenery, 1982) The agricultural sector plays a role in the GDP and employment of most developing countries. A prominent view to understand the impact of agricultural technology in contrast to agricultural productivity was contributed by Markus Eberhardt and Dietrich Vollrath(Eberhardt & Vollrath, 2016) using a simple model of the process of structural change and development. Technology plays a critical role. But to what extent has this been successful? According to a UN working paper, technological advancement fuels productivity growth. (Szirmai, 2008, p. 9). The paper further opines that technological success is success that generates further success. "Once dynamic processes of economic and technological change have been set in motion, these mobilise and call forth new talents and resources, which contribute to further development(Szirmai, 2008, p. 9). Focusing on what is called the Asian Miracle or the Chinese Miracle, the paper opines that it is a misnomer. This is so because according to the paper, "very high growth rates are the normal pattern in a catch up process, where technological backward countries can profit from international available technological knowledge without bearing the costs and risks of developing new knowledge. If catch up takes place, it is usually happens very rapidly. If not, then a country will continue to fall behind"(Szirmai, 2008, p. 12). For the analysis of success and failure in long-run economic development, the paper focuses on the framework of proximate and ultimate sources of growth developed by among others Angus Maddison(1988). The proximate sources of growth suggest ways in which countries can try to improve their position in the international technology and productivity race. The proximate sources refer to the directly measurable sources of growth of output such as capital accumulation, embodied technological change, growth of labour input and human capital.(Szirmai, 2008, p. 13) Changes in science and technology are among the ultimate sources of increases in productive capacity. The locus of such change is in the most advanced economies of the world economic order. From there technological change spreads and diffuses to those developing countries that have sufficient absorptive capacity to profit from global technological change. For some countries technological change creates new opportunities for catch up and even technological leapfrogging. Thus, rapid advances in communication and information technology in the post-war period allow for the emergence of global production chains and the rapid outsourcing of large parts of manufacturing production to developing countries. Szirmai (2008) focuses on 3 propositions that influence success and failure in development. Two of these propositions that focus on technology are that; 1. Technological change is generated in the leading economies of the international economic order. 2. Developing countries that are able to absorb internationally generated technology can profit from the advantages of technological backwardness. They can experience accelerated catch up. Countries that are not able to absorb technology will tend to fall behind. The paper opines that given the location of technological advancement, catch up in the post-1950 globalized economy is only possible if developing countries develop the capabilities to acquire, master and adapt international technology. There is not a single example of successful catch up since the late nineteenth century which did not involve tapping into international technology – e.g. Germany, Russia, Japan, Korea, Singapore, Taiwan and Hong Kong, China and India. The countries that, for some reason or other, are not able or not willing to tap into global technology flows, are the countries that are falling behind and are becoming marginalized in the world economy(Szirmai, 2008).

3. Gaps in Literature

Gaps identified in the literature review as pertains to what is perceived to be lacking both in the policies and the findings of the empirical works conducted and reviewed in this study are seen in the following ways:

1. Policies gaps: taking a close review of the various policy programmes for agricultural development formed in Nigeria and what hindered their success can be seen in the following challenges such as; Non interaction between and among stakeholders; Weak agricultural policy formulations, Role of conflict between different programmes and projects, Short duration of agricultural policies and programmes; Inconsistency/incompatibility of regional policies/programmes with the national

policies/programmes, Emphasis on mainly food and animal production; Delay, embezzlement, misappropriation and lack of fund to pursue specific policy/programme to an expected end; Inadequate virile technical advisory/extension services, absence and Lack/inadequate monitoring and evaluation of programme/project.

2. Study gaps: Based on this review, study gaps that exist in most of the researches carried out on this topic reveals that most studies centered on the role of oil price on GDP neglecting the need for structural adjustment and balanced economy using the tool of diversification policies that foster stability in the economic rather than experiencing shocks each time oil price as the only resort is tampered with by economic uncertainties. Another gap is that there is rear studies if not at all on the complete fuel subsidy removal policy and its impact on the economic as all studies reviewed are based on subsidy or partial subsidy removal effects on GDP.

IV. RESEARCH METHODOLOGY

This section defines the method of data sourcing, design, data analytical techniques, model specification, aprior expectation, econometric test, pre-estimation test, post-estimation test and analysis.

1. Research Design

Data collected for this study are solely from secondary sources and were obtained from the annual abstract of statistics of Central Bank of Nigeria, Petroleum Product Price Regulatory Agency data base (PPPRA), National Bureau of Statistics, FAO, BNARDA. In order to estimate the influence of fuel subsidy on the variables, a dummy variable representing periods of subsidy, partial subsidy and up to complete subsidy removal was included as an exogenous variable in the model. The period of subsidy in this study spanned from 2006 to 2010 while period of partial subsidy was from 2011 to 1st quarter 2023 and complete subsidy till date. In analyzing the data obtained, Johansen co-integration and t-test were used.

2. Method of Data Analysis:

To avoid spurious regression due to the problem of non-stationarity of data, the Augmented Dickey Fuller test was used to check for the presence of the unit root in the variables i.e whether the variables are stationary or not and to what degree. After testing for the stationarity of the variables, next was to test for the co-integration. This test was used to check if long run relationship exists among the variables in the model and was carried out using the Johansen technique. In the short-run, deviations from the long run relationships established could occur due to shocks to any of the variables. In addition, the dynamics governing the short run behavior of the model are different from those in the long run. Due to this difference, the short run interaction and the adjustments to long run equilibrium are important because of the policy implications. The Error Correction Model (ECM) was therefore used to correct or eliminate the discrepancy that occurs in the short run. It was used to test the speed of adjustment from short run to long run equilibrium. The coefficient of error correction variable gives the percentage of the discrepancy between the variables that can be eliminated in the next time period. A prior expectation is that the ECM coefficient must be negative and significant. The higher the ECM the more the speed of adjustment. Finally, the granger causality test was used to check for causality between the variables. That is to test if the explanatory variables contain information that can be used to predict the future dependent variable.

3. Model Specification

In order to appropriately capture the effect of subsidy on agricultural development and then the GDP at large, this study modified the empirical work of [Dorothy Patience etal, University of Agriculture, Makurdi, Nigeria]. A multiple regression model was used with economic growth proxied with Gross Domestic Product Per Capita (GDPpc) as the dependent variable, while Fuel Price (FP) and Agricultural Production (AP) are treated as the independent variables.

The structural form of the model is $GDP = \beta 0 + \beta 1FP + \beta 2Ap + \mu$

Where;

LGDP = Gross Domestic Product

LFP = Fuel Subsidy

LAP = Agricultural Production

μ = Error term (which captures other variables which can affect GDP but could not captured in the model)
βO = Intercept
β1, β2, = slope of the regression equation

A PRIORI EXPECTION
Our a priori expectations are: β1 > β2 > 0, with oil price (inflation) having negative impact on GDP.

Justification of Chosen Variables and Measurement Gross domestic product is a measure that reflects the value of goods and services produced per individual in the economy in a given year and is measured in N' Billion. It is used to capture economic growth and development in this study because it captures the total output produced by each individual and especially in this case measures the growth in different sectors of the economy, and the Agricultural sector is our target this time around. As such it provides a more accurate figure. The A prior expectation is a positive relationship between gross domestic product per capita and agricultural growth and development with the rise in oil price putting pressure on the agricultural production to reduce due to fuel subsidy removal and high cost of farm input including transportation. Fuel price is used to capture the upward rise in the price (inflation) of all other factors in the economy. We expect to have a negative relationship between Fuel price and GDP per capita.

4. Data Analysis and Interpretation

The Unit root test result Non-stationary data produces spurious regression hence the result may be misleading. Therefore, it was expedient to establish the stationarity of the data. The test result of the Augmented Dickey-Fuller statistic for all the time series variables used in the estimation are presented in Table 1. The use of unit root indicates that the variables are not stationary. The result of the ADF showed that the three variables viz; GDPpc, FP, AP is below the critical values at a significance level of 0.05, indicating that these variables are stationary.
Johansen co-integration Test Having confirmed the stationarity of the variable at 1(1) we proceed to examine the presence or non-presence of co-integration i.e the Lon-run relationship among the variables. The co-integration test was carried out using the Johansen technique and it produced the following results:

Table 2. Test for stationarity.
Unit Root Test (ADF):

Variable	ADF Statistic	Critical Value (1%)	Critical Value (5%)	order of integration	P- Value
LGDP	--2.683376	-3.456	-2.678	1(1)	0.0213
LFP	-4.108081	-3.789	-2.876	1(1)	0.001
LAP	2.455702	-3.459	-2.678	1(1)	0.0277

Table 3. Test for Johansen co-integration using trace statistic.
Unrestricted Cointegration Rank Test (Trace)

Eigenvalue	Trace Statistic	0.05 Critical Value
0.624580	26.89507	29.79707
0.467009	11.21972	15.49471
0.069453	1.151725	3.841466

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4. Test for Johansen co-integration using max-eigen value.
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value
None	0.624580	15.67535	21.13162
At most 1	0.467009	10.06800	14.26460
At most 2	0.069453	1.151725	3.841466

Max-eigenvalue test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The Trace statistic and the Max-Eigen statistic (tables 2&3) indicated there is no co-integrating equation at 0.05 level. The result of the Johansen Co-integration tests above strongly accepted the null hypothesis of cointegration, i.e no Long-run relation between the dependent and the independent variables in co-integrating vectors. This implies that

there is no Long-run relationship between the dependent variable and explanatory variables.

Table 5. Result of the over parameterized GDPpc model in Nigeria (ECM1).

Error Correction	D (S1_FP_01)	D (S21__AP_01)	D (S_GDP_01)
CointEq1	-0.684928	-24.35988	-88.22384
	(0.38524)	(11.6157)	(44.6888)
	[-1.77792]	[-2.09716]	[-1.97418]
D(S1_FP_01(-1))	0.425527	14.77688	57.42739
	(0.39342)	(11.8622)	(45.6374)
	[1.08162]	[1.24571]	[1.25834]
D(S1_FP_01(-2))	-0.109861	5.379948	23.80696
	(0.21380)	(6.44644)	(24.8013)
	[-0.51385]	[0.83456]	[0.95991]
D(S21__AP_01(-1))	0.150757	-10.88325	-34.24450
	(0.36560)	(11.0235)	(42.4106)
	[0.41235]	[-0.98728]	[-0.80745]
D(S21__AP_01(-2))	-1.468346	-7.241214	-24.04705
	(0.43028)	(12.9736)	(49.9132)
	[-3.41255]	[-0.55815]	[-0.48178]
D(S_GDP_01(-1))	-0.014597	-0.730040	-2.446460
	(0.02398)	(0.72316)	(2.78220)
	[-0.60861]	[-1.00952]	[-0.87933]
D(S_GDP_01(-2))	-0.036920	-1.914186	-7.212690
	(0.03157)	(0.95174)	(3.66163)
	[-1.16964]	[-2.01124]	[-1.96980]
C	875.4041	14877.93	49878.22
	(427.491)	(12889.6)	(49590.0)
	[2.04777]	[1.15426]	[1.00581]
R-squared	0.833182	0.571106	0.563467
Adj. R-squared	0.666364	0.142212	0.126934
F-statistic	4.994550	1.331577	1.290777
p. value (F-			

Note: values in bracket () and parenthesis [ ]=Standard error and t-value respectively.
***, **, * = significant at 1%, 5% and 10% respectively.

Error Correction Estimates

The coefficient of explanatory variables in the error correction model measures the short run relationship of the dependent variable and the explanatory variables. When conducting error correction technique, an over parameterized model is usually expressed to deal with problem of misspecification in model. This is followed by the parsimonious model, which is derived after some stepwise elimination of relatively insignificant parameters in the over parameterized model**.**

The result in table 4 indicate that the variables and their lags are not significant. This is expected possibly because of multi-collinearity Gurjarati DN[2009]. The R2 of the over parameterized- model present above, however, indicated that all explanatory variables in the model accounts for 83.3318% of the systematic variation in GDPpc. The F-stat value of 4.9945 with probability value of 0.002645 indicated that the whole model is significant. The ECM is positive and significant at 5% level, with its coefficient of 875.4041 implying the speed at which the short-run equation converges to equilibrium in the Long-run is low. However, the ECM is simplified by estimating parsimonious model (ECM2) which is developed from the over parameterized model (ECM1).

The parsimonious test reduced version of the full ECM model by excluding the other independent variable. We compare the goodness of fit between the full ECM model and the reduced ECM model. By the above result in (Table 6) shows that Fuel price (FP) has a positive but not significant relationship with Gross Domestic Product (GDPpc) in Nigeria. The positively signed coefficient of FP is not in conformity with our A prior expectation. A unit increase in FP consequently means the GDP increases by 0.619581 units.

The value of the coefficient of determination (R2 0.230504) shows that the exogenous variable in the ECM equation, FP explains over 23% of the

systematic variation while the remaining about 77% variations in GDP is caused by factors outside this captured model and represented in the other variable (AP) and the stochastic term (μ). Taking into consideration the degree of freedom, the Adjusted R2 dips down to 0.230504. This confirms the goodness of the model in the overall parameterized (full ECM model) form than the parsimonious. This implies that AP and FP taken together has significant linear relationship with the dependent variable, GDPpc than FP alone. The Durbin Watson statistic of 1.4605562 is an indicative of the presence of low positive serieal autocorrelation in the model.

Table 6. Result of the parsimonious GDPpc Model in Nigeria.

Error Correction:	D(S_GDP_01)	D(S1_FP_01)
CointEq1	-0.034450	-0.000468
	(0.02639)	(0.00028)
	[-1.30554]	[-1.65569]
D(S_GDP_01(-1))	0.619581	-0.008963
	(3.18835)	(0.03419)
	[0.19433]	[-0.26217]
D(S_GDP_01(-2))	-1.015923	-0.020420
	(3.22545)	(0.03459)
	[-0.31497]	[-0.59040]
D(S1_FP_01(-1))	46.59019	-0.021742
	(45.4428)	(0.48729)
	[1.02525]	[-0.04462]
D(S1_FP_01(-2))	21.96076	-0.010378
	(32.9870)	(0.35372)
	[0.66574]	[-0.02934]
C	-2009.274	81.55602
	(8425.88)	(90.3514)
	[-0.23846]	[0.90265]
R-squared	0.163393	0.505324
Adj. R-squared	-0.301388	0.230504
F-statistic	0.351549	1.838743

Note: values in bracket () and parenthesis [ ]=Standard error and t-value respectively.

***, **, * = significant at 1%, 5% and 10% respectively.

Table 7. GRANGER COINTEGRATION

Pairwise Granger Causality Tests
Date: 07/01/23 Time: 17:28
Sample: 2006 2023
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
S21__AP_01 does not Granger Cause S1_FP_01	16	4.25735	0.0427
S1_FP_01 does not Granger Cause S21__AP_01		0.15055	0.8620
S_GDP_01 does not Granger Cause S1_FP_01	16	0.97527	0.4075
S1_FP_01 does not Granger Cause S_GDP_01		0.02268	0.9776
S_GDP_01 does not Granger Cause S21__AP_01	16	1.02237	0.3915
S21__AP_01 does not Granger Cause S_GDP_01		0.71867	0.5089

The result of the Pairwise Granger's causality between the variables under study is provided in table 7. Meanwhile, our focus is on the causal relationship between Fuel price burden and economic growth and development in Nigeria. The null hypothesis states the FP does not granger cause AP and GDP. The rule of thumps state that the probability of F-statistic must be less than 0.05 level to show causal relationship at the 5% level. The probability for our causal variables AP and FP are 0.0427 and 0.8620. therefore, we reject the null hypothesis and conclude that there no causal relationship between Fuel Price and Agricultural Production in Nigeria. Similarly, the probability for GDP and FP are 0.4075 and 0.9776. Therefore, we accept the null hypothesis that there is no causal relationship between Gross Domestic Product and Fuel Price. Again, the probability between GDP and

AP are 0.3915 and 0.5089. Therefore, we accept the null hypothesis that there is no causal relationship between Gross Domestic Production (GDP) and Agricultural Production (AP) in Nigeria. It is generally implied that there is no causal relation between FP and GDP, while there is one way relationship between FP and Agricultural Development.

Table 8. Descriptive statistics of variables

Variables	GDP	Fuel Prices	AP	Inflation	Yam Prices	Maize Prices	Beans Prices
Mean	416.95	34.30	46.378	22.81	1425.36	75.81	108.48
Median	339.72	25.00	45.762	16.95	68.61	80.00	100.68
Max	1024.6	97.00	50.949	83.62	31300.0	99.30	274.42
Mini	203.49	5.000	45.074	-5.551	48.14	34.00	48.282
Std. Dev.	195.87	24.90	1.65117	20.29	5920.60	16.17	43.374
Skewness	1.4335	0.954	1.56812	0.962	4.330	-0.622	1.606
Kurtosis	4.3983	3.104	4.17951	3.535	20.65	2.530	6.843
Jarque-Bera	15.7***	5.62**	17.30***	6.15**	597.3***	2.7	38.6***
Probability	0.00039	0.06008	0.000174	0.046	0.00000	0.256	0.00000
Observations	37	37	37	37	37	37	37

** and *** indicate rejection of normality at 5% and 1% level of significance, respectively.

Descriptive statistics of the variables and some selected food production in
Nigeria given the level of oil price and the impact on the GDP. The relationship indicates rejection of normality at 5% and 1% level of significance, respectively.

V. CONCLUSION & RECOMMENDATION

Despite agriculture's crucial position in the national economy, it has remained below its production potentials, particularly in the past three decades. The interest in the oil price movements in the local and international oil markets arises mainly because of its direct bearing on Nigeria's annual budget and attendant cause or influence on macroeconomic indicators. Government officials and certain scholars maintained that the bigger the oil price increase and the longer higher prices are sustained, the bigger the macroeconomic impact. Additional resources generated from the windfall can provide the nation's agricultural sector with the support it needs to tackle food insecurity and foster export diversification. The study found that an economy cannot experience growth with a high inflation rate. The study observed that fuel subsidy removal has a negative influence on the agricultural development and the economy of the country at large, because majorities of the citizens are farmers living in the rural areas. So, removing fuel subsidy will increase hardship in the area because of increase in the cost of transportation farm inputs thus leading to the reduction in agricultural production. The study also observed that the removal of fuel subsidy had a negative short-run effects on the rate of inflation in the study area because if the excess money paid to the cabals in the oil sectors are reinvested into other sector, it will give way to a sound and competitive economy instead of unnecessary money in circulation which the oil dealers do not actually work for. The study also observed that the removal of fuel subsidy does increase the prices of some agricultural produce in the market. It then follows that the effects of fuel subsidy removal had mainly negative effects in the prices of agricultural goods. In summary, the total and full removal of fuel subsidy will be good for Nigerians and if properly applied will go a long way in reviving and sustaining other sectors of the economy.

Recommendations

1. Palliative measures should have been put in place before total removing subsidy on fuel in order to help cushion the adverse effect of the subsidy removal by providing infrastructural facilities and implementing the minimum wage.
2. The Federal Government of Nigeria should use the subsidy on oil to address and adequately develop other sectors of the economy such as the educational for research, agricultural, manufacturing, transportation. This will go a long way in providing employment opportunities and is capable of bringing about the desired economic growth.
3. In addition, more of other resources should be tapped so as to diversify the economy.
4. Full Deregulation of the petroleum sector can also be attained in phases/stages, that is the current increment can be spread over period of six years or more.
5. There is a need to allow for more competition in the supply chain, especially in the issuance of import licensing
6. Existing refineries should be revitalized to work at full capacities more refineries to be built.
7. The government should encourage more private company participation. Private local refineries should be encouraged and supported to foster competition in the oil sector. The various law enforcement agencies such as the

ICPC and EFCC should be fully empowered and well-funded to perform effectively.

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