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THE IMPACT OF FUEL SUBSIDY REMOVAL ON SOCIO-ECONOMIC DEVELOPMENT IN NIGERIA

AN ECONOMETRIC INVESTIGATION

Adewunmi Musa
Department of Economics, University of Ibadan, Ibadan, Nigeria
maleonas@yahoo.com

Remy Hounsou
School of Business Administration and Economics
Houdegbe North American University, Cotonue, Benin Republic
remyhounsou@gmail.com

Iyewumi Titilope Adeyele
Department of Economics, University of Ibadan, Ibadan, Nigeria
iyeadeyele@yahoo.com

Abstract

This study investigates the impact of the fuel subsidy removal on the socio-economic development in Nigeria. Using a price pass-through model, the study employed the error correction model to investigate both the short and long run impact of fuel subsidy removal on socio-economic development in Nigeria using data from 1980 to 2012. The test for trend variability (unit root) to determine the stability of data was done using the Augmented Dickey Fuller and Phillip-Perron test. The study therefore discovered that the fuel subsidy removal does not have short run impact on the social well-being of Nigerians. However, the long run impacts of this policy tells a sterling story, as it was revealed that the deregulation of the downstream sector will ultimately leads to future economic development of the country. This result is therefore consistent with theoretical and some empirical findings that removal of distortions and market efficiency results in economic growth. It is however recommended that there should deliberate and sincere attempt by the government to effectively and efficiently utilize the subsidy funds into strategic developmental projects so as to fulfil the potentials of subsidy removal.

Keywords: Fuel Subsidy Removal, Price Pass-Through, Socio-economic Development, GDP.

INTRODUCTION

The petroleum sector has not only played a dominant and strategic role in the Nigerian economy growth trajectory, but also fundamental in achieving the country's vision of becoming one of the 20 leading economy of the world by the year 2020 (Musa, 2014). This spells so much about the importance of this sector in shaping the "now and then" economic structure of the country. The petroleum sector in spite of the various laudable attempt by the government to diversify the economy still accounts for about 90 per cent of the country's foreign exchange, accounts for 80 per cent of government revenue, and contributes well over 20 per cent to the country's Gross Domestic Product (GDP) (US EIA, 2012; World Bank,2012;IMF,2012).

However, as magnificent as this contributions sound, the idea to deregulate the downstream sector of this sector (aftermath the Structural Adjustment Programme) through the removal of fuel subsidy has not only being met with great scepticism, but also has had tremendous economic and social impacts on the Nigerian populace. The proponents of this idea has suggested the negative economic consequence of price distortion, the "Dutch Disease" syndrome, and energy inefficiency and corruption has some of the principal basis for the removal, with its attendant benefits of price mechanism and competition, fiscal assurance, energy efficiency, reduction in environmental pollution through carbon dioxide emission, etc (Iba, 2009).

The question the proponents of fuel subsidy removal are still able to answer is how significant will the fuel subsidy removal be on the socio-economic activities in the country given the fact that it is the main source of energy for all facet of the economy. The Nigerian society depends primarily on the petroleum, especially Petroleum Motor Spirit (PMS) to drive economic activities, especially as the country is not only a monoculture economy in terms of production, but also consumption. Providing alternative sources of energy since has gone beyond the prints and the media. A serious effort to diversify the economy is still a mirage. Therefore, removing the subsidy on fuel will have grievous economic implications for this entire sector in terms of increasing their cost of production which will ultimately lead to general price increase (Adenikinju, 1998).

Consequently, there has been continuous increase in petroleum prices since the deregulation of the petroleum sector, accompanied with persistent scarcity of petroleum products which the deregulation was expected to halt. It was expected that the deregulation would give room for competition which would ultimately translate to price reduction, with excellent supply and distribution network but reverse has been the case in Nigeria. The petroleum subsidy policy following the oil boom was aimed at reducing the prices of the products thereby minimizing the relative impact the world oil market might have on the masses.

Evidently, the introduction of this policy added significant pressure on both the country's budgetary and fiscal structure.

This is more evident as the sum of about 2.5 trillion naira was spent on fuel subsidy alone between 2006 and 2009, and 600 billion naira budgeted for the fiscal year 2010 (Movement for Economic Emancipation, 2010:10). In 2011 fiscal year, the Presidency and National Assembly approved 240 billion naira as oil subsidy in the Appropriation Act (Folasade-Koyi, 2011:6), and by October 2011, the subsidy scheme has gulped about 1.5 trillion naira showing extra-budgetary spending of 1.2 trillion naira. In reaction to this ugly situation, the Senate President, David Mark accused "a cabal" in the petroleum industry of being responsible for the mismanagement of oil subsidy (Folasade-Koyi). This goes to prove that the problems of oil wealth mismanagement do not rely solely on the withdrawal of oil subsidy, but how well the oil funds are being managed. That is why many Nigerians remain sceptical about removal of petroleum oil subsidy and to tackle the abnormalities in the mismanagement of oil subsidy, the federal government after having series of consultation with stakeholders, declared the removal of fuel subsidy on January 1, 2012. In some quarters, however, the removal of subsidy of petroleum is totally unnecessary if the refineries were working with full capacity. Government expenditure on subsidies has risen due to the importation of refined crude oil which the country has in abundance, coupled with the various degrees of corruptions and the over-invoicing of import by petroleum importer in an attempt by the government lessen the burden associated with the international energy market. With this caveats in mind, the key questions however is to know:

- What is the impact of fuel subsidy removal on economic activities?
- To what extent does the removal affect the welfare of the Nigeria people?
- What policy options are available to the government in militating against this effect?

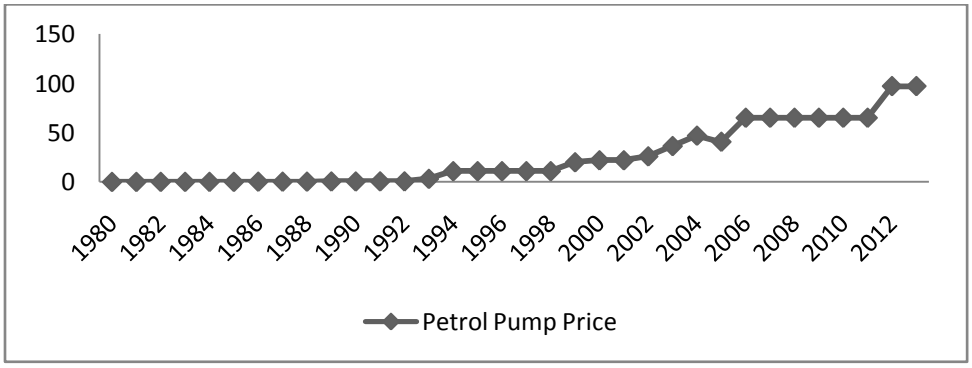
Though, several studies have been done recently to test the impact of petroleum subsidies on the Nigerian economy (e.g Iba, 2009; Maduabuchi, 2011, Oladesu, et al, 2012, Olukayode and Kujenya, 2012), but the review of their studies showed that they have all used discourse analysis and content analysis in their studies by laying emphasis on theoretical discussion, perceptions and interviews of various decision makers in the country. Therefore, this study contributes to the body of literature by adopting an econometric techniques and modelling to test empirically, the impact of petroleum subsidy removal on the socio-economic development in Nigeria. This study therefore differs significantly, because it intends to examine both the long and short run impact of fuel subsidy removal on the socio economic development of Nigeria.

The key objective of this study is to examine the impact of fuel subsidy removal on the socio economic development in Nigeria. The study will employ the Error correction model to examine the relationship between the long and short run impact of fuel subsidy removal on the socio economic development of Nigeria. The remainder of this study includes: Section Two looks at the various stylized facts about petroleum pricing and the Nigerian economy. Section Three examines the review of various theoretical and empirical literatures on this issue. Section Four examines the methodology and analytical issues. Section Five deals with the presentation of various estimations and their policy implications. Section Six therefore concludes the study.

Stylized Facts about Petroleum Pricing and Nigerian Economy

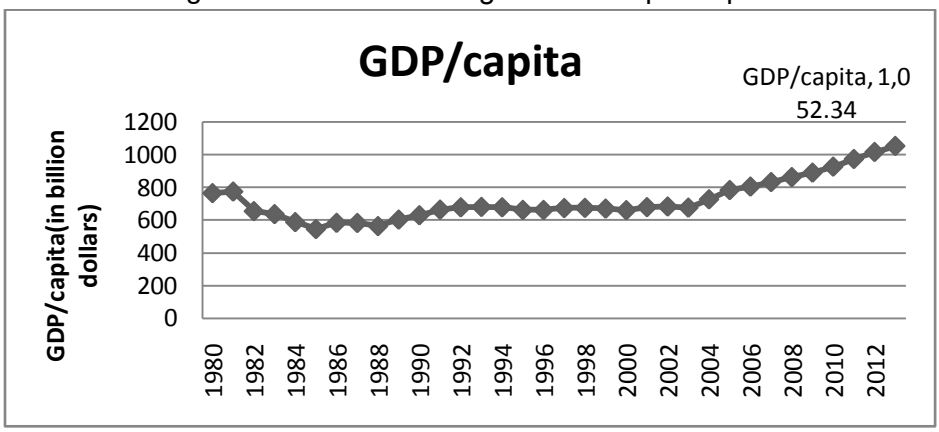
The table below shows the movement of the pump price of petroleum spanning over 30 years, as well as the dynamics of income in the Nigerian economy. This is presented in Fig. 1 below

Figure 1: The dynamics of petroleum pump price and GDP per capital in Nigeria



Source: NNPC (2008, 2009, 2010, 2012); PPPRA (2006)

Figure 2: The trend of Nigeria's GDP per capital



Source: World Bank

From the above figure, it can be observed that the price of fuel has been rising over time although steady in some numbers of years. In 1980, the pump of fuel was 15.3k, and by the beginning of the SAP era, it has moved to almost 4k increasing 97.5per cent of the previous price of 20k. By the end of the SAP era, fuel price has shot to 70k, increasing by 16.67 per cent of the previous price of 60k. In 1993, the price shot to N5 before reduced to N3.75 after several protest. At the beginning of the democratic dispensation, the pump price of fuel stood at N20, increasing by almost 90 per cent from the previous price of N11, then by 2002, the price has already shot to N26 rising by 18.15percent from the last price. The price then increase to 65 naira in 2006. On January 1, 2012, the pump price of petroleum was increased to N141 rising by a whopping 117 per cent before being reduced by 31.20 per cent to N97, and has seen remained.

On the other hand, the GDP per capital has shown remarkable increase over the past 3 decades, although the growth rate of per capital GDP has not been too impressive. From $764.19 in 1980 with 1.3 per cent growth rate, the GDP per capita averaged -5.8 between 1980 and 1986. After a negative growth rate of 13.1 per cent in 1987, it bounced back and reaches 9.9 percent in 1990. By the turn of new millennium, the GDP growth rate stood at 2.7 per cent and has remained positive ever since and peaked at 30.3 per cent in 2004. The GDP growth rate averaged 3.7 per cent between 2005 and 2011. By the end of 2012, the GDP growth rate stood at 3.6 per cent. The reason for this slow growth rate has been attributed to the effect of the oil glut of the early 80's, the ineffectiveness of the SAP, political instability that have engulfed the nation, the issue of corruption, economic mismanagement and the various policy mismatch by the government.

REVIEW OF LITERATURE

There have been many studies on subsidy reforms and how it affects the economy of a country; the environmental and social impact of removing subsidy at a global level (Burniaux et al., 2009; Koplow, 2009). Subsidies can be justified (in theory) if it promote an overall increase in social welfare or perhaps improves the living condition of the people. However, the consensus among economists is that fossil-fuel subsidies (or any subsidy for that matter) have a net negative effect, both in individual countries and on a global scale (Von Moltke et al., 2004). The argument that subsidies or other intervention for that matter is inefficient and serves as a distortion to economic activities has been dead and buried on theoretical ground. Some empirical studies opined that fuel subsidies are not efficient as they serves as distortion to efficient allocation of energy resources in the economy; and also inequitable as the rich people (high income group) are greatest beneficiary than the poor ones (Akinikinju, Babatunde, 2012). Studies have shown

that fuel subsidies are ineffective in fuelling economic growth or in ensuring equitable distribution of income (Adenikinju, 2011). As a matter of fact, most of the studies suggest that fuel subsidies hamper economic growth and undermine the fundamental principle of equity, therefore should be reduced if not eliminated completely. Experiences from the countries that implemented the reform have shown a remarkable improvement in social services delivery.

Beers and Moor (2001) based on simulation analysis, reported an increase in global welfare of $35 billion if consumer subsidies in non-OECD countries are removed. Real income for the world as a whole would increase by 0.7% annually while the terms of trade would improve by 0.5% per year. This can be attributed to the inefficient structure and palliatives measure to relief people from bearing the direct incidence of the fuel subsidy removal. Furthermore, the reduction of fuel subsidies increased the overall incidence of poverty in the Nigeria economy with rural areas worst affected (Afonne, (2011). Nuhu-Koko (2008) observed that the amounts of the national treasury spent on subsidies expenditures are substantial. In 2006, it was about US$2.03billion (1.4% of GDP) and by 2007 it rose to US$2.3 billion (1.3% of GDP) and significantly increased to US$5.37 billion in 2010, due mainly to rising oil price, depreciating exchange rate and increasing demand (Adeola, 2010). Thus, between 2008 and 2010, government petroleum subsidies payments to marketers of petroleum products were estimated at US$10.7 billion. These amount exceeded the total capital allocation to priority sectors in 2009 budget of US$6.57 billion – Security US$0.62 billion; Niger Delta US$0.68 billion; Critical infrastructure US$3.20 billion; Human Capital Development US$1.11 billion; Land Reform & Food Security US$0.96 billion.

According to Jenifer Ellis (2010), removing fossil-fuel subsidies is considered by many to be a win-win policy measure that would benefit not only the global economy, but also the environment and therefore is a “no regret” option for climate-change mitigation (Burniaux et al., 2009). In theory, eliminating fossil-fuel subsidies would result in higher fossil-fuel prices in countries that currently subsidize consumer prices, which would reduce consumption and thereby Green House Gas (GHG) emissions. At the same time, removing subsidies would remove a costly drain on the government budget and allow them divert the extra fund generated from the subsidy removal into other development projects. Consequently, eliminating subsidies to fossil-fuels may be one of the most cost effective and least distortion options available to governments for reducing their GHG emissions (Morgan, 2008). According to Strategic Union of Professionals for the Advancement of Nigeria (SUPA) there is no subsidy on the price of fuel after carrying out a cost determination analysis that the actual cost of fuel is lower than the current retail price. They also claimed that subsidy removal will further deepen poverty in Nigeria, thus, it is more sensible to delay the removal of subsidy until the government delivers

on the electricity supply required to service industries and may be the citizens must have developed confidence in accountability and good governance. This will ensure a more transparent privatisation process that will respond to the market magic of enterprise and 'trickle down' effect. However, there are other authors who believe oil subsidy only creates deadweight loss. Kemp (2011) argued that petroleum product should be priced to reflect its full values to the economy (i.e market price), the nation should obtain benefit from production through tax revenues and assists the poor consumers through direct financial assistance schemes. Chike and Nwachukwu (2011) conducted an empirical analysis on whether fuel subsidy is a fact or fallacy, and they concluded that fuel subsidy is a fact and that government should control the level of fuel subsidy prevailing in the country.

RESEARCH METHODOLOGY

The study employed the Error Correction Model (ECM) to investigate the impact of fuel subsidy removal on the socio-economic development in Nigeria. The data used for this analysis ranged from 1980 to 2013 and are sourced from the World Bank Database, the Nigerian National Petroleum Corporation Statistical Bulletin, and Petroleum Product Pricing Regulatory Agency (PPPRA). In measuring the socio-economic variable, the study employed the GDP per capita as a proxy since there are limited data on the Human Development Index that capture the years under review. The study also employs the price pass-through analysis to measure the fuel subsidy removal, which the domestic price of petroleum (AfDB, 2012).

The study therefore employs the unit root test to determine the statistical properties of the variables to determine if they are stationarity. This is done in order to avoid spurious regression and misleading judgement. This is done using the Augmented Dickey-Fuller (ADF) and Phillip-Perron Test. We then proceed to test whether there exists a long run relationship between the variables by adopting the Engle and Granger test since we are dealing with two variables (Engle and Granger, 1988, 1991).

Several studies have investigated the impact of fuel subsidy of socio-economic development (see Adenikinju, 2011, Adesina, 2012, Adewale et al (2012), Birol et al, 1995, Ellis, 2010). Petroleum subsidy based on the classical economic theory of regulated monopolies within which subsidies themselves, are perceived as distorting to the forces of demand and supply. The theory of regulated monopolies suggests that in the subsidies flow from the producers (or marketers) to the consumers, there is a transmission loss in which appropriately, about half of the subsidies accrue to the few actors who are licensed in the industry and their agents. At each further point in the value chain, dissipation of the subsidy occurs before final transmission to the consumer. Such dissipation includes a "dead weight" loss of any subsidy

where no one benefits. In other words, fuel subsidy as well is a distortion and a hindrance to socio-economic development. Therefore, we begin our model by stating:

$GDP/cap_t = f(PPP_t, GDP/cap_{t-1})$ ……..(1)

Where GDP/cap represents GDP per capita, which is a proxy for socio-economic development. As said earlier, this was chosen as a result of limited data on the Human Development Index (HDI), PPP represents the pump price of petrol, which is the domestic price of fuel, and GDP/cap_{t-1} is the lagged value of the dependent variable. The rationale for such specifications usually derived from specific stock adjustment mechanism, habit persistence or adaptive expectations (Engsted and Bentzen, 2001). By turning eqn(1) into econometric model, we have:

$GDP/cap_t = \beta_0 + \beta_1 PPP_t + \beta_2 GDP/cap_{t-1} + \mu_t$ ..... (2)

μ_t is the stochastic disturbance term which has zero mean and its normally distributed (Woodridge, 2005). Taking the log of eqn(2), we have:

$\ln GDP/cap_t = \beta_0 + \beta_1 \ln PPP_t + \beta_2 \ln GDP/cap_{t-1} + \mu_t$ ..... (3)

$\beta_0, \beta_1, \beta_2$ are the parameters in the model to be estimated. We therefore expects $\beta_1 < 0$, $\beta_2 > 0$. The rationale behind this is that we expect fuel subsidy to have negative impact on growth as a result of distortion, fuel subsidy removal is expected to have short run negative impact on welfare, but we expect the long run impact to be positive. However, the lagged value of the dependent variable which is past income is expected to have a positive influence on income. We then proceed to the estimation.

ANALYSIS & RESULTS

Unit-root Test

The statistical properties to determine the stationarity and non-stationarity of the variables are therefore presented as follows:

Table 1: Unit root Test Using Augmented Dickey-Fuller (ADF) and Phillip-Perron Test

Variables	ADF at level	ADF at 1st Diff.	Phillip-Perron Test
$\boldsymbol{lnGDPcap_t}$	-2.84	-5.27^{*}	-5.42^{*}
$\boldsymbol{lnPPP_t}$	-1.43	-4.63^{*}	-4.59^{*}

**Significant at 1 per cent level*

***Significant at 5 per cent level*

****Significant at 10 percent level*

From the table 1, it can easily observe that none of the variable is stationary at level. However, both variables are stationary at first difference at 1 per cent level of significance. This result is in line with econometric theory that all economic variables are not stationary at level and can only be stationary at first difference (Gujirati, 2008). This makes the lagged value of the dependent variable stationary at level. We then proceed to conduct the co-integration to determine whether there is long run relationship with the variables.

As shown in the appendix, the result of the co-integration test shows that, with an intercept and trend, there is one co-integrating relation between the variables under review. This therefore implies that there is a long run relationship between fuel subsidy removal and socio-economic development in Nigeria. We also conducted the Granger Pair-wise causality test to determine which of the variable causes the other. The result shows that the pump price of petrol is significant at 1 per cent which makes us rejected the null hypothesis. The result of the long run relationship is therefore present below.

Table 2: Long-run Estimation

Dependent Variable: lnGDPcap

Variable	Coefficients	t-statistics
$Constant$	2.90	53.77^{*}
$\ln PPP_t$	0.055	5.69^{*}
$\ln GDPcap_{t-1}$	-0.03	-1.57

R-squared	0.512218	Mean dependent var	2.851687
Adjusted R-squared	0.480749	S.D. dependent var	0.073499
S.E. of regression	0.052963	Akaike info criterion	-2.954355
Sum squared resid	0.086957	Schwarz criterion	-2.819677
Log likelihood	53.22404	F-statistic	16.27651
Durbin-Watson stat	0.304687	Prob(F-statistic)	0.000015

**Significant at 1 per cent level*

***Significant at 5 per cent level*

****Significant at 10 percent level*

We present the results of the long run estimation of the impact of fuel subsidy removal on the socio-economic development of Nigeria in Table 2 above. The result shows that increase in domestic price as a result of subsidy removal will lead to about 6 per cent growth in per capital GDP in the long run. This is because the pump price of petroleum is significant at 1 per cent level. However, the past income does not have significant influence on the model. The

goodness of fit of the variable suggests that about 51 per cent of the systematic changes in the explanatory variables is accounted for by the dependent variable. The model also is satisfactory as reported by the F-value of 16.28. We then present the short run dynamics of the model.

The short run dynamics which is presented in the appendix however reveals that the fuel subsidy removal does not have short run impact on the socio-economic development in Nigeria has reflected in the insignificant nature of the error correction term. It should also be noted that none of the variables are significant at any level except lagged value of income which is only significant at 10 per cent. Having presented and analyse the result of the estimation, the following implication can be drawn from the result;

- Based on the findings, fuel subsidy removal shouldn't be an instant decision without palliative measures, thus, government should ensure that the energy sector is effective in making electricity power supply regular; this would reduce the burden of subsidy removal on the people. However, results shows that fuel subsidy removal is a significant factor towards long term economic growth of the country.
- Government should ensure that they tackle corruption so that the proceeds of the fuel subsidy are effectively put into proper use. For example, in massive investment in infrastructure development, this can only be helpful for future growth.
- Efforts should also be made towards renovating our refineries. This will help build domestic production and as such bring down the price of fuel in a competitive market system without government having to subsidise petroleum products.
- The fact that there is no short run impact between the fuel subsidy removal and welfare is a pointer to the fact that the hardship experienced during this period are artificial and not as a result of the price increase. Government should however formulate that will regulate the activities of fuel marketers and some unscrupulous elements in the petroleum that sabotage the efforts of government by creating artificial scarcity for personal benefits thereby creating hardship to the Nigerian people.

CONCLUSION

The study examined the impact of fuel subsidy removal on the socio-economic development in Nigeria using a time series data between 1980 and 2013. The study therefore employed an error correction model to estimate this impact. However, there is room for further study on this subject both in terms of scope and methodology. The use of both qualitative and quantitative techniques in determining relative impacts of the fuel on economic well-being of Nigerians will provide more realistic results. It was discovered that there is long run benefits of the subsidy removal, no such relationship existed in the short run. Policies geared towards achieving long

term economic growth and development should formulated and implemented and massive investment of the subsidy proceeds on infrastructural development is good starting point, accompanied by sound monetary and fiscal policy to fully achieve the long run goal of the subsidy removal. Policy should also be geared towards curtailing the activities of unscrupulous marketers that create artificial scarcity of this product for their personal gain. Finally, efforts should geared towards rebuilding and renovating the nation's refineries, this will help increase our domestic production and ultimately drive down the price of petrol while contributing to the nation's economic growth and guaranteeing energy security in the country.

REFERENCES

Adegbulugbe, A.O and A. Adenikinju (2008), "Energizing Vision 2020". Paper Presented at the 1st International Conference of NAEE/IAEE at the Transcorp Hilton Hotel, 29th – 30th of

Adenikinju, A, F. (1998), "Energy Supply Institutions and the State in an Oil Exporting Country",International Association for Energy Economics Experimenting with Freer Markets: Lessons from the last 20 Years and Prospects for the Future: Conference Proceedings, Volume 1. Quebec: International Association for Energy Economics. pp.121 – 128

Afonne E., (2011), "Politics of Oil Subsidy: The Cartel's Fraudulent Acts" ,Nigerian Newsworld, October 24, 15(34).

Anderson, K. and McKibben, W.J. (1997). "Reducing Coal Subsidies and Trade Barriers: Their Contribution to Greenhouse Gas Abatement." Seminar Paper 97-07. Centre for International Economic Studies, University of Adelaide: Adelaide, Australia.

Birol, F., Aleagha, A.V. and Ferrouki, R. (1995). "The economic impact of subsidy phase out in oil exporting developing countries: a case study of Algeria, Iran and Nigeria." Energy Policy . 23(3):209-215.

Burniaux, J.-M., Chanteau, J., Dellink, R., Duval, R. and Jamet, S. (2009). "The economics of climat change mitigation: How to build the necessary global action in a cost-effective manner." Economics Department Working Papers No. 701.

Chike,H., and Bacon,R., (2001)," Abuses in Fuel Markets: How to Protect Consumers and Public Health. View point series, Note 237.World Bank Group.

De Moor, A. (2001). "Towards a Grand Deal on subsidies and climate change." Natural Resources Forum 25(2):167-176.

Engsted, T., Bentzen, J.,(2001), Modelling of energy demand: a guided tour through the jungle of unit roots and cointegration. Energy 26, 45–55.

Folasade-Koyi A., (2011), "Senate Probes N1.5 trillion Subsidy", Daily Sun, Thursday, October 13, 6(2201)

Hon. Uche Nwadialo (2012), "Fuel Subsidy Removal: A Nigerian Dilemma", retrieved from http://www.vanguardngr.com/2012/01/fuel-subsidy-removal-a-nigerian-dilemma/

Iba, L. (2009), "Fuel Crisis: Will deregulation roll away all our problems?", *Daily Sun*, October 5, 3(39).

International Energy Agency (IEA). (1999). World Energy Outlook 1999: Looking at Energy Subsidies – Getting the Prices Right . International Energy Agency: Paris.

Jeniifer Ellis (2010). The Effects of Fossil-Fuel Subsidy Reform: A review of modeling and empirical studies.

Kemp, A., (2011)," Issues in Energy and Petroleum Economics", University of Aberdeen Business School.

Maduabuchi, E. (2011), Fuel Subsidy: Courting the Big Bang?" *Sunday Independent,* December 18,(15–17)

Morgan, T. (2007). Energy Subsidies: Their Magnitude, How they Affect Energy Investment and Greenhouse Gas Emissions, and Prospect for Reform . Menecon Consulting.

Movement for Economic Emancipation, (2010), Save Our Soul on the Huge Loss of Fuel Subsidy," The Nation, Monday March 11, 5(1319)

National Bureau of Statistics, (2011). The Nigerian Statistical Fact Sheets on Economic and Social Development. Abuja: NBS.

Oladesu, O., Olaoye – Osinkolu, Olugbamila, A., Olaniyi, B., and Omokhunu, G., (2011), "Fuel Subsidy: Employers arm Government to Avert Crisis," *The Nation,* Monday, December 19,(1-2).

Olukayode, T. and Kujenya, J. (2012), "New Year, New Pains as Fuel Price Hike Bites," *The Nation*, Thursday, January 5,(6 -7).

S.U.P.A,(2010),"A report on the Petroleum Prices and Subsidies in Nigeria. Available at http://www.supanigeria.org/index.php?option=com_

Tunde Bakare (2012), "Much Ado about Fuel Subsidy", retrieved from the world wide web http://www.vanguardngr.com/2012/01/much-ado-About-fuel-subsidy.

Von Moltke, A., McKee, C. and Morgan, T. (2004). Energy Subsidies: Lessons Learned in Assessing their Impact and Designing Policy Reforms. Sheffield: Greenleaf Publishing.

World Bank,(2013).World Development Indicators, World Bank Database. World Bank: Washington, DC.

APPENDIX

1.1 Augmented Dickey Fuller on D(GDPCAP)

Null Hypothesis: D(GDPCAP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.273159	0.0008
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

1.2 Augmented Dickey Fuller on D(PPP)

Null Hypothesis: D(PPP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=8)

		t-Statistic
Augmented Dickey-Fuller test statistic		-4.627749
Test critical values:	1% level	-4.273277
	5% level	-3.557759
	10% level	-3.212361

*MacKinnon (1996) one-sided p-values.

1.3 Phillip-Perron Unit-root Test on D(GDPCAP)

Null Hypothesis: D(GDPCAP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.420891	0.0006
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.

1.4 Phillip-Perron Unit-root Test on D(PPP)

Null Hypothesis: D(PPP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 9 (Newey-West using Bartlett kernel)

		Adj. t-Stat
Phillips-Perron test statistic		-4.593499
Test critical values:	1% level	-4.273277
	5% level	-3.557759
	10% level	-3.212361

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(PPP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=8)

		t-Statistic
Augmented Dickey-Fuller test statistic		-4.627749
Test critical values:	1% level	-4.273277
	5% level	-3.557759
	10% level	-3.212361

*MacKinnon (1996) one-sided p-values.

2.1 Granger Pair-wise Causality Test

Pairwise Granger Causality Tests
Date: 01/24/14 Time: 20:14
Sample: 1980 2013
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
PPP does not Granger Cause GDPCAP	32	4.79990	0.01646
GDPCAP does not Granger Cause PPP		0.05933	0.94252

3.1 Johansen Co-integration Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.689284	41.35307	25.87211	0.0003
At most 1	0.116096	3.949002	12.51798	0.7495

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.689284	37.40407	19.38704	0.0001
At most 1	0.116096	3.949002	12.51798	0.7495

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

4.1 Long run Regression Results

Dependent Variable: GDPCAP
Method: Least Squares
Sample: 1980 2013
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.899129	0.053913	53.77432	0.0000
PPP	0.054540	0.009587	5.688634	0.0000
GDPCAP1	-0.031367	0.019962	-1.571342	0.1263

R-squared	0.512218	Mean dependent var	2.851687
Adjusted R-squared	0.480749	S.D. dependent var	0.073499
S.E. of regression	0.052963	Akaike info criterion	-2.954355
Sum squared resid	0.086957	Schwarz criterion	-2.819677
Log likelihood	53.22404	F-statistic	16.27651
Durbin-Watson stat	0.304687	Prob(F-statistic)	0.000015