Trade Liberalization and Petroleum Price Adjustments in Developing Nations: What Happens To Nigeria's GDP?

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Abstract: *Do countries with lower policy-induced barriers to international trade grow faster, once other relevant country characteristics are controlled? There exists a large empirical literature providing an affirmative answer to this question. This study is one of such empirical investigations. Utilizing time series annualized data on Nigeria's GDP and petrol pump prices over a 25 year period, the paper evaluated the effect of trade liberalization via subsidy withdrawal on the nation's GDP. The study applied the computer-based linear regression approach using the current Statistical Package for Social Science (SPSS).The rResult showed a positive and significant effect of petrol pump price adjustments on GDP. Based on this finding, the paper concludes that planned liberalization via careful withdrawal of government subsidy can be favourable to nations especially the developing ones like Nigeria. It was however recommended that beforehand, government should provide enabling competitive business environment and necessary palliative measures before withdrawing subsidy to cushion any negative effect that could arise from such policy action.*
Keywords: *Economic Growth , Liberalization, Petrol Pump Price, Subsidy, Trade Barrier*

1. Introduction

Trade liberalization involves the removal of import quotas and other quantitative restrictions, reduction of the level and dispersion of import tariff rates, removal of export taxes, removal of protections for local industries, elimination of non-tariff barriers, currency devaluation, and withdrawal of all forms of government subsidies (Shaffaedin, 1994; Obadan & Obioma, 1999; Adubi & Okunmadewa, 1999; Amegashie, 2006; Obadan, 2005/2008; etc). This reform policy is one of the cardinal instruments of global market competitiveness and economic integration. It has remained a key issue in the World Trade Organization's negotiations and agreements. The economic justifications for trade liberalization have over the years been hotly debated. The positive rationale is built on the premise that trade liberalization creates open markets leading to a more efficient allocation and utilization of resources through, inter alia, the exposure of the domestic economy to world market disciplines and better access to state-of-the-art technologies. Again, the appeal of a more open economy is based on a simple but powerful premise that such will foster greater integration among operating economic agents which in turn will improve economic performance. Additionally, trade liberalization is argued to offer new opportunities such as expanded markets and the acquisition of new technological ideas, all of which can yield not only increased production but also higher standard of living (Sachs and Sievers, 1999; Sachs and Warner 1997; Ajayi, 2001, etc).

Trade liberalization has over the years gained significant ground in the developed economies. Most of these economies have expanded largely their trading horizon and have formed strong economic blocs for competitive trade advantage among members. Since the 1970s, developing countries have embarked on widespread rapid trade liberalization. In the past, the Nigeria government had tried a plethora of trade policy options aimed at boosting her foreign trade and reducing volatility in export earnings. Apart from the era of the commodity marketing board which dates back to the 1940s, several austerity measures were adopted at the beginning of 1980s. They include price stabilization measures of 1982; restrictive monetary policy and stringent exchange control measures of 1984 amongst others (Ojo, 1994; Onayemi and Akintoye, 2009; Eleje and Okafor, 2010). These efforts proved ineffective. There was need for a complete economic re-design; a total paradigm shift that will ensure economic stability, restructure the productive and consumptive pattern, and ensure reasonable growth in the macroeconomy. The Federal Government of Nigeria in reaction launched the Structural Adjustment Programme (SAP) in 1986 with four cardinal objectives as follows:

> *Restructuring and diversifying of the productive base of the economy to reduce over-dependence on oil exports; reducing the dominance of unproductive investment in the public sector; encouraging non-oil exports; and improving the non-oil sector's efficiency by intensifying growth potentials of the private sector.*

Unarguably, SAP introduced trade liberalization regime in Nigeria. The regime included among other things, reduction of import restrictions, abolition of export prohibition, establishment of an export development fund, currency devaluation, liberalization of foreign exchange system, abolition of the commodity marketing boards and withdrawal of government subsidy especially on foreign trade.

The quest for greater penetration in the global market environment for Nigeria's export merchandise occassioned by SAP has led to the signing of bilateral, regional and trade preferential agreements with different countries. Apart from signing bilateral agreement with Benin Republic, Bulgaria, Equatorial Guinea, Jamaica, Niger, Romania, Turkey, Uganda and Zimbabwe, investment promotion and protection treaties have also been signed with France, Switzerland, the United Kingdom, the Netherlands, North Korea, China and Turkey (Okoh, 2004). Nigeria is one of the founding members of the World Trade Organization (WTO), the body that is currently charged with the responsibility of removing all trade barriers between the nations of the world such that the whole world becomes one big global market. No wonder the issue of subsidy withdrawal on oil, Nigeria's major foreign exchange earner, have appeared topical ever since her adoption of SAP. Between 1986 and 2010 precisely, Nigeria has gradually withdrawn significant proportion of her oil subsidy and has adjusted petrol pump price by twelve times (see appedix 11). The implications of this gradual subsidy withdrawal on the performance of the nation as measured by several macroeconomic indicators have not been exhaustively verified empirically. This means that there is still a research lacuna in that direction. This paper contributed to filling the gap by basically looking at subsidy withdrawal through the lens of the gross domestic product. The study therefore investigated the effects of changes in petrol pump price on Nigeria's gross domestic product.

2. Review of Related Literature

The possible relationship between trade liberalization and growth has in the last three decades been hotly argued in the growth and development literature. Yet, this issue is still far from being resolved. At best, theoretical growth studies have rather established a complex and ambiguous relationship (Krueger, 1978; Harrison; 1996; Rodriguez & Rodrik, 2001; Yanikkaya, 2002; etc). Research efforts into the impact of liberalization on growth started gaining ground towards the end of the last 20th century. The renewed interest on this same topic in the mid-1980s was aggravated by the phenomenal differences among the growth rates of the East Asian, the Latin American, and Sub-Saharan African countries. While developing countries in Latin America and Sub-Saharan Africa which pursued import substitution strategies experienced relatively lower growth rates, East Asian countries, that adopted liberal export-promotion policies, consistently outperformed other countries (Dollar & Kraay, 2001 & 2001; Yanikkaya, 2002; etc).

Meanwhile, the experience of many other developing countries with successful export performance however shows that a high degree of import liberalization is neither necessary nor sufficient for export expansion (UNCTAD, 1989/2000). It has been argued that the immediate effect of import liberalization is to widen balance of payments deficits, often accompanied by a change in the composition of imports in favour of consumer goods, particularly luxuries (Obadan, 2008). It is also established that one major problem faced by the developing countries in the liberalization process is that they may be able to control how fast to liberalize their imports and hence increase the goods imported, but cannot determine by themselves how fast their exports grow (Khor, 2000). This is because many important factors, besides liberalization, determine export performance. Example, the price of the existing exported products, market access, infrastructure, human and enterprise capacity required for new exports, etc.

Over the 1990s the conviction that liberalization is good for growth was fostered by several highly visible and well-promoted cross-country empirical studies including Dollar (1992), Sachs and Warner (1995), Edwards (1998) amongst others. Recently however, these have received rough treatment from Rodriguez and Rodrik (2001), who argue, inter alia, that their measures of openness are flawed and their econometrics weak. Moreover, liberal trade is usually only one of several indicators of openness used, and one which often seems to weigh rather lightly in the overall result (Harrison; 1996).

A large number of empirical studies have made use of a variety of cross-country growth regressions to test endogenous growth theory and the importance of trade policies (Levine and Renelt, 1992; Edwards, 1993; Temple, 1999; Rodriguez and Rodrik , 2001; etc). Probably due to the difficulty in measuring liberalization, different researchers have used many different measures to examine the effects of trade liberalization on economic growth. An ideal measure of a country's liberalization would be an index that includes all the barriers that distort international trade such as average tariff rates and indices of non-tariff barriers (Yanikkaya, 2002, Winter, et.al., 2002; etc). Anderson and Neary (1992) have developed a "trade restrictiveness index", which in principle incorporates the effects of both tariffs and non-tariff barriers. However, it is not available for a large sample of countries. Thus, some studies have used the available data to measure trade liberalization and some other researchers have constructed indices that measure the openness of a country including Leamer (1988), Dollar (1992), and Sachs and Warner (1995).

The weight borne by cross-section studies in the recent growth literature is remarkable, particularly since so many economists profess to distrust them (Winter, *et.al.*, 2002). Cross-sectional or panel studies assume that the same model and parameter set applies to country A and B is heroic. So too is the neglect of dynamics and path dependency implicit in the view that the data reflect stable steady state relationships. There are also huge cross-country differences in the measurement of many of the variables used. Obviously, important idiosyncratic factors are ignored; and there is no indication of how long it takes for the cross sectional relationship to be achieved (Brock & Durlauf, 2001; Winter, *et.al.*, 2002; Valadkhani, Layton, & Karunaratne, 2005 etc). Nonetheless the attraction of simple generalization has seduced most of the researchers into taking their results seriously. One exception is Srinivasan and Bhagwati (2001), who chide such researchers for forgetting the problems and neglecting other approaches to the liberalization-growth link. The latter included detailed case studies of particular countries, which considered a wide variety of causes and channels for growth, but frequently find openness at the heart of the matter.

While econometric difficulties of establishing beyond doubt that liberalization through openness enhances growth still holds, available data employing simple trade share parameter indicate that African economies are relatively open compared to the advanced economies or those of developing countries as a whole (Obadan, 2008). Obviously, Sub-Saharan African economies as a group appear to be more open than those of the high income economies. Obadan (2001/2004), in his analysis of trade ratios for individual Sub-Saharan African countries, shows that out of 38 countries covered, the ratios fell in 11 countries between 1986 and 1996, and were quite low in others. In contrast, the available statistics show that the ratios of foreign trade to GDP in Asia and Latin America recorded positive increases and, indeed, very significant increases in Asian countries of Hong Kong, Malaysia and Singapore.

Furthermore, Obadan (1996/2001) in his studies also has found Nigerian economy to be relatively very open. Table 2.1 below shows that Nigeria's index of openness increased from an average of 43.5 per cent in 1975–79; to 71.8 per cent in 1995–98. From 2002–2005, the index stood at 51.9 per cent. This is relatively high compared to the index of openness of some industrial countries. For instance, Obadan (2008) documented that in 2005, the index of openness of some industrial countries were as follows: United States of America (21:2%); Japan (24.5%); Australia (31.6%); Italy (42.2%); United Kingdom (39.7%). However, some developing countries globalizers such as Malaysia, Hong Kong, Korea, Singapore, Thailand, Chile, China, etc., have higher indices of openness than Nigeria. Meanwhile, these countries are more integrated with the world economy than Nigeria considering various output, trade and financial indicators. Hence, inspite of Nigeria's relative openness, the degree of her integration with the global economy as examined in Table 2.1 (Owolabi, 1998). Thus, Obadan (2007), UNECA (2007), World Bank (2007), Stern (2002), and Gondwe (2001) have all observed that openness is not enough for meaningful participation in global trade and growth. Accordingly, they conclude that liberal trade and investment policies will generate little or no benefits if other institutions are not in place or are bad.

Table 2.1: Nigeria's Share of World Trade and Degree of Openness (Per Cent)

	1975-79	1980-84	1985-89	1990-94	1995-98	2002-05
Exports/GDP (%)	23.28	18.78	21.04	34.58	41.93	33.13
Imports/GDP (%)	20.24	18.34	12.76	22.72	29.90	18.25
Total Trade/GDP(%)	43.50	37.14	33.78	57.28	71.83	51.93
Share of World Exports (%)	1.00	0.84	0.36	0.32	0.24	0.24
Share of World Imports (%)	0.82	0.78	0.24	0.20	0.16	0.135
Share of Total World Trade (%)	0.92	0.81	0.28	0.25	0.20	0.26

Source: *Computed from: IMF, International Financial Statistics Year Book, 1999; World Bank, World Economic Indicators, 2000, 2007; Central Bank of Nigeria. Statistical Bulletin, December, 1998 and 2006.*

3. Methodology

3.1 Empirical Design and Data

The paper employed the *ex-post facto* research design in obtaining, analyzing and interpreting the relevant data. The justification for the choice is that *ex-post facto* design allows the researcher the privilege of observing one or more variables over a period of time. Accordingly, the research variables for this study were observed over a 25 year period 1986–2010. The paper utilized secondary data on Nigeria's gross domestic product (GDP) at current basic price and petrol pump price over the period covered. Data were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin and various issues of January editions of Punch and Vanguard daily Newspapers. Data collected were analyzed and tested to determine the impact of the changes in petrol pump price on the gross domestic product (GDP) in Nigeria.

3.2 Research Hypothesis

H_0: *There is no positive and significant effect of changes in petrol pump price on grossdomesticproduct (GDP) in Nigeria.*

H_A: *There is positive and significant effect of changes in petrol pump price on grossdomesticproduct (GDP) in Nigeria.*

3.3 Analytical Econometrics and Justification

The adopted model for this paper draws theoretical strength from Endogenous growth models. Endogenous growth models demonstrate the channel by which trade policies affect economic growth and development. Accordingly, the model chosen is based generally on previous works of Prebisch and Singer (1950), Winter et. al., (2002), Bacchetta, et.al (2007) amongst others who have done similar studies using data from other economies. Specifically however, the paper patterned the modified computer-based linear growth regression model employed in Bacchetta, et.al (2007) to test the stated hypothesis. The model is of the form:

$$GDP_V = \beta_0 + \beta_1 TOT_{voli,t} + \beta_2 IDS_{i,t} + \beta_3 (CONTROL) + \mu_{it} \quad \text{..... (v)}$$

This model was reconstructed to accommodate the main variables of the study as follows:

$$GDP_V = \beta_0 + \beta_1 PUMPPRICE_{vt} + \mu_{it} \quad \text{..... (vi)}$$

Where:

GDP_v = Values of Nigeria Gross Domestic Product at current basic price
$PUMPPRICE_{vt}$ = Value of petrol pump price in Nigeria within the period covered

4. Results and Discussions

The regression model specified in the methodology is translated from the SPSS result output in appendix 2 thus:

GDP = -1226461 + 368091.1 Pumpprice + e

Result arising from the coefficient table of the SPSS output indicated that the value of the constant term in the above equation is -1226461. This value is negative and statistically not significant at 0.097. Meanwhile, the constant value of -1226461 is the intercept of the regression line indicating that gross domestic product (GDP) in Nigeria will be -1226461 assuming the explanatory variable is zero. The coefficient of petrol pump price (pumpprice) is 368091.1. This value is positive and statistically significant (i.e, 0.000) at both 95% and 99% significant value respectively. This means that for every one unit increase in petrol pump price in Nigeria holding other variables constant, gross domestic product (GDP) will increase by 368091.1 naira value. The implication is that subsidy withdrawals over the period covered significantly and positively influenced growth of the gross domestic product in Nigeria.

The above submission is confirmed further using relevant descriptive statistics in the SPSS output (see apendix 11). The Analysis of Variance (ANOVA) tested for the acceptability of our model from statistical significant viewpoint by looking at the goodness of fit from the F-statistics. Accordingly, the significant value of the F-statistic from the ANOVA table is 0.000. The value is less than 0.05 an indication that the model did a good job in explaining the variation in the dependent variable. The sign of the Pearson correlation coefficient between GDP and Pumpprice is 0.963. This indicates a strong positive relationship between gross domestic product (GDP) and petrol pump prices in Nigeria. The multiple correlation coefficient (R) is 0.963, an indication of a strong relationship between the predicted and the observed values of the dependent variable. The R square statistics is 0.928 implying that 92.8% of the variations in the dependent variable is explained by the independent variables. Again, the R square adjusted is also high at 0.92.5 signifying that after adjusting for errors, 92.5% of the variations in the dependent variable is still explained by the independent variable in the regression model.

5. Empirical Validation, Conclusion and Recommendations

5.1 Empirical Validation

The t-statistic was used to validate the formulated hypothesis. The critical t-statistic value from the statistical table at 95% confidence interval is 1.708. This value is less than the computed t-statistic value of 17.234 in the regression output. Meanwhile, the t-statistic decision rule on test of hypothesis is to reject the null hypothesis and accept the alternate hypothesis when the computed t-value is greater than the tabulated t-value or decide otherwise when the computed t-value is less than the tabulated t-value. Based on this rule, we rejected the null hypothesis and accepted the alternate hypothesis. We thus conclude that there is a positive and significant effect of changes in petrol pump price on the gross domestic product in Nigeria. This means that oil subsidy withdrawal has significant positive effect on economic growth of Nigeria as measured particularly in her gross domestic product.

5.2 Conclusion and Recommendations

Going by the finding of this paper, openness-led growth is however attainable for Nigeria when measured from the GDP perspective. For this to be consolidated, the industrial countries need to play a complementary role to the efforts of Nigeria and other poor developing countries to reap significant benefits from liberalization. This they can do principally by opening their markets rather than closing it as evidenced in the literature. Openness and integration constitute the platform of liberalization which is argued to induce growth. Evidence from the literature review showed that Nigeria and most developing countries are very open but poorly integrated into the global market. To meet the subsisting challenges and accelerate its integration process with the world economy in a sensible way therefore, Nigeria need to: develop a strong production base predicated on value added exports; diversify export structures and develop manufactured export capability; develop adequate human and institutional capacity, physical infrastructures, capital and technology, etc, necessary for integration. It also needs to design and implement sound economic policies, as well as develop and operate within the framework of regional and sub-regional groupings.

5.3 Suggestions for Further Studies

The findings of this study have exposed other areas of research that would help optimize and balance the value-added impact of trade liberalization studies in Nigeria particularly and generally in developing nations. The existing challenging arguments against trade liberalization require that further studies be replicated such that will capture the possible impact of trade liberalization on other macroeconomic parameters including inflation, income per capita, poverty and unemployment.

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Appendix 1: Petrol Pump Price and GDP in Nigeria 1986-2010

Year	Pump Prices (=N=)***	GDP**
1986	0.15	69,146.99
1987	0.15	105,222.84
1988	0.15	139,085.30
1989	0.15	216,797.54
1990	0.60	267,549.99
1991	0.60	312,139.74
1992	1.98*	532,613.83
1993	5.00	683,869.79
1994	11.00	899,863.22
1995	11.00	1,933,211.55
1996	11.00	2,702,719.13
1997	11.00	2,801,972.58
1998	11.00	2,708,430.86
1999	11.00	3,194,014.97
2000	21.00*	4,582,127.29
2001	26.00	4,725,086.00
2002	26.00	6,912,381.25
2003	40.00	8,487,031.57
2004	45.00	11,411,066.91
2005	45.00	14,572,239.12
2006	45.00	18,564,594.73
2007	67.50*	20,657,317.67
2008	65.00	24,296,329.29
2009	65 .00	24,794,238.66
2010	65.00	29,205,782.96

Sources: ** Central Bank of Nigeria Statistical Bulletin (2010)
*** Vanguard Newspaper, January (2012)

Note: *****Averages of pump prices which changed twice within the periods. That is, petrol pump price changed from 0.70/3.25; 20.00/22.00; and 70.00/65.00, within the years 1992, 2000, and 2007 respectively.

Appendix 2: Effect of Changes in Petrol Pump Price on GDP

Descriptive Statistics

	Mean	Std. Deviation	N
GDP	7390993	9146222.757	25
pumpprice	23.4112	23.93818	25

Correlations

		GDP	pumpprice
Pearson Correlation	GDP	1.000	.963
	pumpprice	.963	1.000
Sig. (1-tailed)	GDP	.	.000
	pumpprice	.000	.
N	GDP	25	25
	pumpprice	25	25

Variables Entered/Removed [b]

Model	Variables Entered	Variables Removed	Method
1	pumpprice [a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: GDP

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.963[a]	.928	.925	2504690.58	.928	297.027	1	23	.000	.960

a. Predictors: (Constant), pumpprice

b. Dependent Variable: GDP

ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2E+015	1	1.863E+015	297.027	.000[a]
	Residual	1E+014	23	6.273E+012		
	Total	2E+015	24			

a. Predictors: (Constant), pumpprice

b. Dependent Variable: GDP

Coefficient Correlations [a]

Model			pumpprice
1	Correlations	pumpprice	1.000
	Covariances	pumpprice	5E+008

a. Dependent Variable: GDP

Collinearity Diagnostics [a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	pumpprice
1	1	1.706	1.000	.15	.15
	2	.294	2.411	.85	.85

a. Dependent Variable: GDP

Residuals Statistics [a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-1171248	2E+007	7390993	8811430.679	25
Residual	-5010152	6506322	.00000	2451954.344	25
Std. Predicted Value	-.972	1.842	.000	1.000	25
Std. Residual	-2.000	2.598	.000	.979	25

a. Dependent Variable: GDP