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Petroleum Pump Price Increase and Business Environment: The Nigerian Economy Standpoint

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Abstract: *There have been a lot of theories that explain the impact of petroleum price increase on the business and economic growth of any country, especially Nigeria which has been one of the major oil producing countries in the World. In the past years, oil has become more volatile and has grown worse in the present Nigeria and this has affected balance of payments, oil trade and revenue from oil. This paper empirically examined the influence of price increase on economic growth in Nigeria between the years 1985 – 2015 using ordinary least square (OLS), linear multiple regression model analysis in assessing five key macroeconomic variables. The data were extracted from Central Bank of Nigeria (CBN) statistical bulletin while the overall analysis shows that oil price increase has a relationship with Gross Domestic Product (GDP) and both of them have significant influence on each other. The results further show that oil output, economic openness of oil, oil import and oil export has positive relationship with GDP and consequently the impact on oil revenue is negatively related to real Gross Domestic product. It could be deduced from the foregoing that increase in petroleum pump prices would lead to a decrease in National income because it constitutes a major source of revenue for the government but has a cash withdrawal effect on the business environment and economy. There is, therefore, the need for the government to adopt a more pragmatic economic policies and strategies to revamp the ailing economy. These strategies and policies include liberalization of its economy and thus become oil exporter oriented country; curbing the corruption levels in the governance; investment in infrastructural facilities and finally rehabilitation of all the nation's moribund refineries to enhance daily operating production capacity of refined crude oil and other related products in the country.*

Keywords: *Business Environment, Economic Growth, Macroeconomic Variables, Petroleum, Price Increase.*

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I. Introduction

Nigeria is an oil exporting developing country with a population of about 178 million (2014 gradual economies) and the most populous country in Africa. The country is endowed with significant energy resources such as oil reserves 70 billion barrels (2014 estimates); Gas reserves 187 trillion cubic feet (2009 estimates) and Oil production 2.016 mbd. The Oil sector has influenced significantly the growth potential of the country since 1970. Oil contributed $391b to government revenue during the years 1970 to 2005; and Oil exports $593.6b during 1970-2005. These represent 75% of total government revenue and 96% of foreign exchange earnings over the period. Apart from its direct fiscal benefits, energy sector is strategic for enhancing the competitiveness of the Nigerian business environment and economy. The legacy of oil has also imposed significant costs on the economy such as price distortions, Volatilities, Dutch-disease, Corruption and inefficiencies. A major feature of the sector is the dominance of the government in pricing, supply and investment. In spite of cumulative efforts by successive governments, oil subsidy remains one of the most intricate socio-economic policy issues in Nigeria.

By the time Nigeria became politically independent in October 1960, agriculture was the dominant sector of the economy, contributing about 70% of the Gross Domestic Product (GDP), employing about the same percentage of the working population, and accounting for about 90% of foreign earnings and Federal Government revenue. The early period of post-independence up until mid-1970s saw a rapid growth of industrial capacity and output, as the contribution of the manufacturing sector to GDP rose from 4.8% to 8.2%. This pattern changed when oil suddenly became of strategic importance to the world economy through its supply-price nexus, as shown in Table 1.

TABLE 1: Nigeria Sectorial Contribution to Gross Domestic Product (GDP**)**

Sector	**1960**	**1970**	**1980**	**1990**	**2000**	**2010**
Agriculture	64.1%	47.6%	30.8%	39.0%	35.7%	28.35%
Manufacturing	4.8%	8.2%	8.1%	8.2%	3.4%	5.5%
Crude Petroleum	**0.3%**	**7.1%**	**22.0%**	**12.8%**	**47.5%**	**40.6%**
Others	30.8%	37.1%	39.1%	40.0%	13.4%	25.55%

Source: CBN annual report and statement of Account (2010)

However, since oil was discover in commercial quantity in Nigeria, oil has dominated the economy of the country. In Nigeria, oil accounts for more than 90 percent of its exports, 25 percent of Gross Domestic Product (GDP), and 80 percent of its government total revenues [1]. Thus, a small oil price changes can have a large impact on the economy as a whole. For instance a US$1 increase in the oil price in the early 1990s increased Nigeria's foreign exchange earnings by about US$650 million (2 percent of GDP) and its public revenues by US$320 million a year. Nigeria's reliance on oil production for income generation clearly has serious implications for its economy.

Secondly, oil is an important commodity in the economy of any country in the world because it is a major source of energy for domestic and industrial use. Oil therefore serves as intermediate product and as well as consumer commodity. There are different end products of oil; these include kerosene, diesel, gasoline, and others. Changes in the prices of either the crude oil or any of the end products are expected to have impact on users and the business environment at large.

Oil prices traditionally have been more volatile than many other commodity or asset prices since World War II. The trend of demand and supply in the global economy coupled with activities of OPEC consistently affects the price oil. The recent changes in the global economy are so rapid and unprecedented. This is partly due to increased demand of oil by China and India. However, the current global economy melt down suddenly counteracted the skyrocketing oil price. For instance, in 2006, the oil price per barrel was between $59.4 – 65.4 in the world market. By 2007, it rose significantly to $83.73 – 93.40 per barrel and dropped to about $75.3 - $64.4 per barrel. In October 2009 it rose again to $78.25 and dropped to about 75.1% per barrel in December in this same year. The price later picked up to $84.42 to $93.00% in March and December, 2010 respectively, with the fiscal budget which led to the downward review of the budget oil bench mark price. Today oil price is oscillating between 38.78b and 40.11b per barrel (CBN Banking/rates/crude oil asp). The oil volatility in the world market had serious consequences on Nigeria Fiscal budget which has led to the downward review of the budget oil bench market price. This rapid change has become a great concern to everybody including academics and policy makers; therefore a study of this kind is timely.

The objective of this paper is to examine the impact of Petroleum Pump Price increase and business environment on the Nigeria economy using some key macroeconomic variables. An ordinary least square (OLS) model is developed and variance decomposition test is carried out using multi-regression analysis. The paper is divided into six sections; following this introduction is section two which presents the literature review. Section three focuses on Methodology and model specification. Section four discusses the Empirical findings and Analysis. Section five Summarizes and concludes the study, while section six discusses policy recommendations.

II. Literature Review

2.1 Conceptual Review

According to [2], Oil is a versatile and flexible, non-productive, depleting, natural resource which is a fundamental input into modern economic activity providing about 50% of the total energy demand in the world, excluding the former centrally planned economics. Nigeria in the 20th century, the subsidy was reduced to only 21% following oil price review. Then the price of crude oil to the domestic refinery was increased in the international market.

[3], opined that the oil boom rather than contributing positively to the living standard has afflicted the Nigeria economy with the so-called "Dutch disease". The Dutch disease phenomenon used to analyse the effects of commodity booms in terms of "spending" and "resource movement" effects [4]. Following [5], he examined the Nigerian case by abstracting from the resource movement effect since the oil sector can be considered to be a separate enclave with its own capital, labour and technology; that is, it does not compete with the non-oil sector for resources. According to [5], the "spending effect" operates as follows: in the non-oil economy, both tradable and non-tradable are produced (tradable are used here to refer to tradable other than oil). Let *r* denote the relative price of tradable to non-tradable (the real exchange rate). Assuming tradable and non-tradable are normal goods, the demand for both increases following a rise in real income associated with oil boom. Equilibrium can be described solely domestic supply. The excess demand for non-traded goods that arises following the boom can be eliminated by a rise in their relative price, that is, a fall in *r* (real exchange rare appreciation). This draws resources out of the tradable sector into the non-tradable sector, so that non-tradable

output rises and tradable output falls. The consequent effect of decline in the tradable sector is what is called Dutch disease. It is accompanied by real depreciation, that is, a rise in *r.* as pointed out by [5]. This is, strictly speaking, a "Dutch disease" since with the boom the economy does not attain a higher level of consumption and welfare.

[6] observed that price of oil products is derived from crude oil prices and it therefore follows that prices of petroleum products should trail crude oil prices. [7] asserted that the causes of price instability is attributed to scarcity caused by refinery maintenance and rehabilitation problem, low capacity utilization, supply and demand inequality. [8] in his own contributions viewed the oil exploration as a damaging instrument rather than for it to a contributing factor to the welfare of the residents. Whereas activities such as flaring of natural gas and seismic surveys constitute great damages to the environment, more far reaching environmental destruction result from oil spillage. Soil, plants, animal and water resources are adversely affected, usually because of the toxicity of oil. This view was collaborated by [9] and [10] who argued that the resultant environmental problem arising from oil spillage is well above the benefits that are derived by the resident especially in the Niger Delta areas.

[11] traced the revenue that was generated from the sale of crude oil in Nigeria between January 2001 and March 2004 in millions of US dollars. He found lots of inconsistencies and discrepancies in the reports published by different government agencies such as Central Bank of Nigeria, Nigerian National petroleum Corporation and Accountant General of the Federation. Whereas the Central Bank of Nigeria reported US $22.3 billion, Nigeria National Petroleum Corporation reported US $21.9 billion. From the above values, one can see that the cumulative discrepancies between the three series are significant. The inconsistencies discovered suggested that the oil revenue must have been mismanaged. And rather for the government to utilize these revenues to cater for the welfare of the people, the major part of it was stolen. According to [11] Nigerians remain poorer than the international poverty average despite the huge revenue generated from oil. Estimated had it that more than 70% of Nigerians lived in abject poverty. The country is still characterized by infrastructure inadequacy, low level of income, high level of poverty, high mortality rate, poor accommodation, and malnutrition and high level of water born diseases after 55 years of oil record.

The concept of business environment connotes external forces, factors and institutions that are beyond the control of the business and they affect the functioning of a business enterprise. These include customers, competitions, suppliers, government and the social, political, legal and technological factors etc. While some of these factors or forces may have direct influence over the business firm, others may operate indirectly thus, business environment may be defined as the total surroundings, which have a direct or indirect bearing on the functioning of business. It's also viewed as the set of external factors, which are uncontrollable in nature and affects the business of a firm.

Before concluding the argument on Dutch disease, [12] supported the presence of Dutch disease" in Nigeria in terms of the distributive consequences of oil revenues. According to him, the most important Dutch disease effects can be linked to the crowding-out of agricultural and manufacturing exports. Any crowding-out of labour-intensive sectors can have adverse distributional consequences. A booming agricultural or manufacturing sector provides many economic opportunities to low-skill workers. Whereas a booming petroleum sector offers them few opportunities, except through government transfers or rent-seeking. When a booming petroleum sector crowds out agriculture or manufacturing exports, the opportunities for the poor could drop sharply.

2.2 Theoretical Review

The analytical framework for examining petroleum can be viewed from the theoretical discussion of efficiency price, externalities and equity as well as an investigation of the elements of petroleum pricing in a market economy [13].

i. Efficiency Price, Externalities and Equity

The modern theory of public economics provides us with a very useful framework within which to analyse taxation and public policy to achieve production efficiency. These conditions are feasibility of production efficiency and any resulting profits are either negligible or can be taxed fully. The feasibility condition would be met if competitive conditions prevailed in the economy and externalities would be corrected or internalized. The later condition would be met if it is assumed that government has unrestricted tax tools i.e. all goods can be taxed fully. The basic rule of public pricing could therefore be started as follows: set producer (input) prices at an efficient level and then choose the appropriate level of taxes or subsidies based on equity criterion to get the consumer (final) prices.

Many sources and types of externalities cannot be corrected easily because of restrictions on the tax tools or other instruments available to the government. Hence, even if it is possible to separate the producer and consumer prices if particular distortions and externalities elsewhere in the country that cannot be addressed directly, makes it difficult to compute the appropriate prices for the producers.

Assuming that the authorities can choose the appropriate level of taxes and tariffs for non- petroleum inputs, the theory of public economics suggests that input prices for petroleum prices should be set equal to the efficient prices. If particular distortions and externalities elsewhere in the country that cannot be addressed directly, makes it difficult to compute the appropriate prices for the producers.

Assuming that the authorities can choose the appropriate level of taxes and tariffs for non-petroleum inputs, the theory of public economics suggests that input prices for petroleum prices should be set equal to the efficient prices. If there are no trading constraints in the international or border price (import or export parity price), suitably adjusted for quality differences and the domestic transport and distribution margins; the rule is applicable to all traded goods, including petroleum products.

ii. Components of Petroleum Product Prices

Hossain (2003) identifies six components that should be considered while setting market prices of petroleum products:

$P = P^* + t_1 + t_2 + t_3 + t_4 + t_5$……... (1)

Where

P = market price

P* = International (border) price

t_1 = road user chargers (to address road damage externality)

t_2 = tax/subsidy to address environmental externality

t_3 = tax/subsidy to reduce variability in price

t_4 = tax/subsidy set for distributional (equity) considerations, and

t_5 = tax for revenue considerations

Tax authorities impose (t_5) on final consumption purely to raise revenue based in revenue requirements. It could take the form of VAT or other taxes. Taxation of petroleum products for revenue reasons should be based on same general tax principles as in the case of taxation of the other commodities. A VAT is a non-discriminatory and neutral tax that avoids distortion with taxation of inputs to production.

iii. Economic Effects of Government Involvement in Pricing

The government was involved in the downstream sector not only through ownership of infrastructure, but also through regulation of wholesale and retail prices. Liberalization at September, 2003 ended the retail price regulation, and marketers started setting prices to cover their operating costs. Until September 2003, the government through its Petroleum Pricing and Marketing Committee (PPMC) set wholesale and retail prices for petroleum products, and also fixed the margin for the private retailers. The rationale for price fixing was that Nigeria consumers should have access to cheap fuel at a uniform price across the country [13].

2.3 Petroleum Products Pricing and Subsidy in Nigeria [14] stated that the petroleum products' pricing method employed in Nigeria over time is highlighted below:

1) The Import Parity Method

This involves pricing petroleum products within the context of the international markets from where they are imported to Nigeria. The cost related elements were costs of products free on board, insurance cost, freight, ocean loss, port charges, landing cost, marketing margin, profit margin, and handling charges. This method applied prior to 1978 during which about 50 percent of the products consumed were imported.

2) Direct Processing – Fee Pricing Method

This method takes account of the unit cost of processing or refining oil. It was adopted in the early eighties, when most of the refineries were relatively new and almost all of the products required were met from local refineries. The main elements of costing here were, the cost of crude oil plus cost of transportation to the refineries, refining cost, the petroleum products marketing company (PPMC) cost which included storage, overhead and transportation costs, as well as dealers' and marketers' margins. The costs were shared among the different products by using weighted average of the product prices.

3) Netback Pricing Method

This method was popular in the mid-eighties following the collapse of crude oil prices to as low as $9 per barrel. In a bid to realize more value from its crude, Saudi Arabia pioneered the use of Netback pricing methods and some countries, including Nigeria, followed suit. Crude oil is considered very useful relative to the products derived from it. The netback method emphasizes the prices of the products and the yield pattern of

given crude. It considers the gross products' worth of the crude and nets off the cost elements such as freight, ocean loss, insurance and refiner's margin.

2.4 Empirical Evidence

The oil price shock of 1973 and the subsequent recession gave rise to a plethora of studies analyzing the effects of oil price increases on the economy. The early studies included [15], [16], [17] and [18], all of which documented and explained the inverse relationship between oil price increases and aggregate economic activity. Later, empirical studies – such as, [19] and the study on Energy Modeling Forum as documented in [20] – confirmed the inverse relationship between oil prices and aggregates economic activity. [18], [21], and [22] documented similar oil-price-economy relationships in cross country analysis. [19] made a definitive contribution by extending the analysis to show that all but one of the post-World-War-II recessions were preceded by rising oil prices and those other business cycle variables could not account for the recessions. This is also evident in the current economic meltdown.

In an extensive survey of the empirical literature, [23] found that the estimated oil price elasticity of GNP in the early studies ranged from -0.02 to -0.08, with the estimates consistently clustered around -0.05. [24] thought the estimated effects seemed too high to be consistent with a classic supply shock, but [23] argued that values around -0.05 are in the ballpark for output elasticity that are roughly equal to factor shares. After the 1973 oil-price shock, oil's share in GNP was around 4-6 percent.

Several different channels have been proposed to account for the inverse relationship between oil price movements and aggregate economic activity. The most basic is the classic supply-side effect in which rising oil prices are indicative of the reduced availability of a basic input to production. Other explanations include income transfers from the oil-importing nations to the oil-expecting nations, a real balance effect and monetary policy. Of these explanations, the classic supply-side effect best explains why rising oil prices slows GDP growth and stimulates inflation.

Rising oil prices can be indicative of a classic supply-side shock that reduces potential output, as in [25], [26] and [27]. Rising oil prices signal the increased scarcity of energy which is a basic input to production. Consequently, the growth of output and productivity are slowed. The decline in productivity growth lessens real wage growth and increases the unemployment rate at which inflation accelerates. If consumers expect the rise in oil prices to be temporary, or if they expect the near term effects on output to be greater than the long-term effects, they will attempt to smooth out their consumption by saving less or borrowing more which boots the equilibrium real interest rate. With slowing output growth and an increase in the real interest rate, the demand for real cash balances falls, and for a given rate of growth in the monetary aggregate, the rate of inflation increases. Therefore, rising oil prices reduce GDP growth the boost real interest rates and the measured rate of inflation.

If wages are nominally sticky downward, the reduction in GDP growth will lead to increased unemployment and a further reduction in GDP growth-unless unexpected inflation increases as much as GDP growth falls. The initial reduction in GDP growth is accompanied by a reduction in labour productivity. Unless real wages fall by as much as the reduction in labour productivity, firms will lay off workers, which will generate increased unemployment and further GDP losses. If wages are nominally sticky downward, the only mechanism through which the necessary wage reduction can occur is through unexpected inflation that is at least as great as the reduction in GDP growth. However, studies in Nigeria such as [28], [29] and [30] did not find any significant impact of oil price shock on variables like money supply, price level, and output and government expenditure.

III. Methodology and Model Specification

Ordinary least square multiple regression techniques were used using data source from CBN and annual report 2015 and derived from selected annual key microeconomics time series in Nigeria for a period of 31 years (1985-2015) as indicated in the attached appendix A.

However, the model specification adapted was very close to the newer endogenous growth theory prescription and thus extends the traditional growth accounting framework to focus on the variables which are economic growth (GDP) as dependent variable, domestic petroleum price, International oil price, total oil price are explanatory variables. In accordance to this new growth theory, economic growth is determined by high level of savings and investments, economic efficiency, appropriate economic system and sound economic policy, among others [31]. The endogenous growth model here is linear and could be mathematically written in functional form as stated below:

$GDP=f(DPP, IOP, OEP)$ ---------- (2)

$GDP = \alpha 0 + \beta 1DPP + \beta 2IOP + \beta 3OEP + U$ ---------- (3)

Where

GDP = gross domestic product
DPP = domestic petroleum price
IOP = international oil price
OEP = total oil exports
$\alpha 0$ = constant or intercept
$\beta 1$, $\beta 2$, $\beta 3$ = parameters
U = error term
A prior expectation

The expected signs of the coefficient of the explanatory variable are,$\beta > 0$, $\beta 1 < 0$, $\beta 2 > 0$, $\beta 3 > 0$.

$\beta 1$ is expected to be negative because an increase in domestic oil price would have a negative effect on GDP. $\beta 2$ is expected to be positive because an increase in the international oil price would have a positive effect on GDP. $\beta 3$ Total oil exports would have a positive effect on GDP.

This result and the corresponding analysis is reliable as most of the variables are consistent in terms of A prior expectations, more so, they were all found to be statically relevant as the F- statistic value was examined to be significant. The R-Squared which measures the goodness of fit of the explanatory variables was found to be strong even when adjusted for the degree of freedom; there was no case of violation of econometrics assumptions as there was no autocorrelation.

IV. Empirical Findings and Analysis

This section presents the empirical findings with the time series properties of the variables used for the estimation. This is meant to ascertain the appropriateness of the specification and determine the underlying properties of the data generating process. The analysis is based on time series data. This therefore requires some specific approaches to the analysis. It is generally know that the econometric estimation of a model on time series data demands that the series be stationary as non-stationary series usually result in misleading inferences, [32] provide a pure standard technique to deal with this problem. This involves testing the variables of an equation for stationary. The estimation therefore begins by conducting a stationary test to ascertain the stationary.

Unit Roots: testing for unit roots is a key preoccupation in the study of time series models and co-integration. A stochastic process with a unit root is itself non-stationary. The presence of unit root implies that the time series under scrutiny is non-stationary while the absence of a unit root means that the stochastic process is stationary. The most commonly accepted method for testing for unit roots is by the use of Augmented Dickey-Fuller test (ADF).

The model is estimated first by testing for the Unit root test. The unit root test is conducted to determine the stationarity or otherwise of the data since it is a time series data. The result of the unit root test for the four variables is presented in the table 4.1 below and the subsequent attached appendix B

TABLE 4.1: ADF Test Result

VARIABLES	LEVEL	1st DIFFERENCE	REMARK
GDP	-3.588509		1(0)
DPP	-3.615588		1(0)
IOP	-3.511309		1(0)
OEP	-3.592462		1(0)

Source: Compiled by Author

GDP from the stationarity test result revealed that it was stationary at levels as indicated by 1(0). Similarly DPP was stationary at level indicated by 1(0). In the same vein IOP and OEP were all stationary at levels as depicted in table 4.1 above:

GDP 32.05511 = 2.643400DPP +3.0725031OP +4.032346OEP
S.E (15.44279) (1.162346) (1.846275) (1.529192)
T=value 2.065733 -2.274194 - 2.687125 - 3.038154
Adjusted R-squared = 0.827476
F=ratio = 1.932453
Durbin Watson =2.069920

The result with respect to the signs of estimated parameters are consistent with Economic theory. From the result estimated, DPP has a negative sign which agrees with a prior condition that a one per cent increase in DPP will result to about 58% decrease in GDP. The parameter estimate of DPP from the result shows negative sign. This is also in line with economic theory. The adjusted R-squared values shows the expandability power of the model as about 83% of the total variation of GDP is explained by the explanatory variables which shows the

fit of the model. The Durbin-Watson (DW) values of 2.06 shows the absence of autocorrelation which proves the econometric power of the model.

V. Summary and Conclusion

This paper focused on the impact of petroleum price increase and business environment on the Nigeria Economy within the last 31 years (1985 to 2015). The importance of petroleum to Nigeria can only be fully appreciated when one realize the dominant role it plays in our economy. From the result, Domestic oil price is negative to GDP. This means that increase in oil prices would lead to a decrease in national income because it constitutes a source of revenue for the government and also a cash withdrawal from the economy.

Again, the result shows that total oil export has a positive relationship with GDP which conforms to the A prior expectation so also international oil price in relation to GDP, And lastly, domestic oil price has a negative relationship with GDP which conforms to A prior expectation during the period under review.

From the results, it can be interpreted that as the price of PMS increases, the price of other goods will also increase. However an explanation for this is that, increase in oil price result in an upward shift in aggregate supply curve, will raise and output falling along a downward slopping aggregate demand curve. Subsequent wages adjustment can restore the initial level if output and price e.g. energy resources are used to produce most goods and services. This will aggregately impact on GDP.

From the analysis given in the summary above, it can be concluded that the increase in oil price will invariably lead to a negative effect on the economy given the fact that all other price of output will increase. Conclusively, it is worthy of note to state that before the price of oil to be increased in Nigeria, there must be other macro- economic factors that should be put in place so that the masses or population of the economy would not feel the negative impact on oil prices which is one of the factor that leads to increase in oil revenue.

VI. Recommendations

The significance of the Finding, obtained from the study poses a serious challenge to economist and policy makers. Based on these findings, the study recommend the following imperative suggestions:

- Government should put in place palliative measures to cushion effect of price increase in premium motor spirit.
- Government should try to curb the corruption levels coherent in the government administration so that the oil revenue derived from the increment of general price level could be put into efficient and effective use.
- Government should export more oil produced than its imports so that its balance of payments in relation to international oil trade can be favourable which would lead to more positive effect on the economy.
- Government should try to liberalize its economy to allow for free flow of oil products in and out of the economy but it should base on more export than imports.
- Government should put in place policies that would help to enhance the capacity of all refineries in Nigeria so that it would help to reduce the price of fuel or oil in Nigeria.

The study also recommended that the government should strive to achieve sustainable price stability, stronger capital market with minimized distortions, fiscal discipline that channels funds to productive sectors to encourage private investors. Economic efficiency driven by infrastructural supports and enhanced technological capabilities, strong institutional and economic reforms can increase production capacity. In addition, stable policy to promote trade, domestic and foreign investments should also be highly emphasized. There is also need for the policy makers to take cognizance of the policy lag effect and design policies in line with the expected magnitude of expected changes. Strategies for poverty eradication in addition to prudential and effective management of government expenditure can also lead to increased savings specifically through the oil revenue.

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APPENDIX A

YEAR	GDP	DDP	IOP	OEP
1985	31,546.76		227.4	13,632.3
1986	205,222.06	150.48	119.8	10,680.5
1987	199,685.25	158.36	225.5	8,003.2
1988	185,598.14	114.63	171.6	7,201.2
1989	183,562.95	112.86	282.4	8,840.6
1990	201,036.27	160.77	51.8	11,223.7
1991	205,971.44	80.87	913.9	8,368.5
1992	204,806.54	118.97	3,170.1	28,208.6
1993	219,875.63	136.01	3,803.1	28,435.4
1994	236,729.58	177.01	4,671.6	55,016.8
1995	267,549.99	174.92	6,073.1	106,626.5
1996	265,379.14	186.50	7,772.2	116,858.1
1997	271,365.52	182.80	19,561.5	201,383.9
1998	274,833.29	181.03	41,136.1	213,778.8
1999	275,450.56	178.30	42,349.6	200,710.2
2000	281,407.40	189.55	155,825.9	927,565.3
2001	293,745.38	211.25	162,178.7	1,286,215.9
2002	302,022.48	207.88	166,902.5	1,212,499.4
2003	310,890.05	186.57	175,854.2	717,786.5

2004	312,183.48	195.17	211,661.8	1,169,476.9
2005	329,178.74	193.29	220,817.7	1,920,900.4
2006	356,994.26	562.71	237,106.8	1,839,945.3
2007	433,203.51	518.37	361,710.0	1,649,445.8
2008	477,532.98	567.58	398,922.3	2,993,110.0
2009	527,576.04	624.34	318,114.7	4,489,472.2
2010	561,931.39	686.77	797,298.9	7,140,578.9
2011	595,821.61	755.60	710,683.0	7,191,085.6
2012	634,251.14	831.77	768,226.84	8,110,500.4
2013	672,202,.55	914.94	1,386,729.93	9,913,651.1
2014	718,977.33	978.52	1,063,544.2	8,067,233.0
2015	775,525.70	1,047.10	2,073,579.0	10,639,417.4

APPENDIX B
UNIT ROOT RESULTS
GDP ADF LEVEL
Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag= 9)

		t-Statistic	Prob.*
Augmented Dickey- Fuller test statistic		2.131114	0.9972
Test critical values:	1% level	-3.588509	
	5% level	-2.929734	
	10% level	-2.603064	

*MacKinnon (1996) one sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 09/07/16 Time: 13:53
Sample (adjusted): 1985-2015
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.018316	0.016193	1.131114	0.2644
C	1.431154	3.477808	0.411510	0.6828

R-squared	0.046562	Mean dependent var	5.006591
Adjusted R-squared	0.066456	S.D. dependent var	9.651274
S.E. of regression	9.620069	Akaike info criterion	7.409969
Sum squared resid	3886.920	Schwarz criterion	7.491068
Log likelihood	-161.0193	Hannan-Quinn criter	7.440045
F-statistic	1.279420	Durbin-Watson stat	1.576410
Prob(F-statistic)	0.264425		

DPP ADF – LEVEL
Null Hypothesis: DPP has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic – based on SIC, maxlag=9)

		t-Statistic	Prob*
Augmented Dickey-Fuller test statistic		1.703070	1.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DPP)
Method: Least Squares
Date: 08/07/16 Time: 14:14
Sample (adjusted): 1985-2015
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(-1)	4.158825	0.884279	4.703070	0.0001
DDPP(-1))	-3.835181	1.073919	-3.571200	0.0012
D(DPP(-2))	-4.813716	0.906559	-5.309878	0.0000
D(DPP(-3))	-4.383975	1.016984	-4.310763	0.0002
D(DPP(-4))	-5.414043	1.178916	-4.592389	0.0001
D(DPP(-5))	-4.328051	0.923891	-4.684589	0.0001
D(DPP(-6))	-8.055008	1.745398	-4.614996	0.0001
C	-40149.55	63503.48	-0.632242	0.5320

R-squared	0.869311	Mean dependent var	320188.4
Adjusted R-squared	0.867150	S.D. dependent var	659434.7
S.E. of regression	311299.3	Akaike info criterion	28.31956
Sum squared resid	2.91E+12	Schwarz criterion	28.66432
Log likelihood	-530.0717	Hannan-Quinn criter	28.44222
F-statistic	19.43299	Durbin-Watson stat	1.811110
Prob(F-statistic)	0.000000		

IOP ADF LEVEL
Null Hypothesis:IOP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.465977	0.1305
Test critical values:	1% level	-3.511309	
	5% level	-2.929734	
	10% level	-2.603064	

*MacKinnon (1996) one-sided p-values

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IOP)
Method: Least Squares
Date: 27/06/16 Time: 14:42
Sample (adjusted): 1985-2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

IOP(-1)	-0.251906	0.102153	-2.465977	0.0178
C	705.9898	679.7157	1.038655	0.3049

R.squared	0.126475	Mean dependent var	16.33409
Adjusted R0squared	0.105677	S.D dependent var	4345.413
S.E. of regression	4109.399	Akaike info criterion	19.52433
Sum squared resid	7.09E+08	Schwarz criterion	19.60543
Log likelihood	-427.5353	Hannan-Quinn criter	19.55441
F-statistic	6.081042	Durbin-Watson stat	1.903003
Prob(F-statistic)	0.017830		

OEP ADF LEVEL

Null Hypothesis: D(OEP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.858701	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(OEP)
Method: Least Squares
Date: 27/06/16 Time: 14:43
Sample (adjusted): 1985-2015
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OEP(-1))	-1.068626	0.155806	-6.858701	0.0000
C	17.24778	677.0436	0.025475	0.9798

R-squared	0.534312	Mean dependent var	1.076744
Adjusted R-squared	0.522954	S.D. dependent var	6427.883
S.E. of regression	4439.645	Akaike info criterion	19.67993
Sum squared resid	8.08E+08	Schwarz criterion	19.76185
Log likelihood	-421.1185	Hannan-Quinn criter.	19.71014
F-statistic	47.04178	Durbin-Watson stat	1.986110
Prob(F-statistic)	0.000000		

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