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PETROLUUM INDUSTRY LINKAGES AND NIGERIA'S ECONOMIC DEVELOPMENT*

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INTRODUCTION

Nigeria, Africa's most populous country and potentially its largest economy, has witnessed decades of dictatorship and misrule. Accompanying this misrule are severe economic problems of an unprecedented magnitude. A notable illustration of the economic crisis is the persistent deterioration in the living standard of her citizens over time. As estimated by Okojo-Iweala et al (2003), the average Nigerian is poorer today than in 1972 despite the country's nearly US\$500 billion earnings from oil export between 1973 and 2009. Poverty is deep and pervasive with about 70 per cent of the population currently living in absolute poverty compared with 42 per cent in 1992 and 27 per cent in 1980. Continuous infrastructural decay is significant; corruption is endemic while institutions of governance and accountability are being grossly weakened. Today, with per capita income level of US\$300, Nigeria is one of the poorest countries in the world.

In sharp contrast to the current economic conditions, four decades ago, Nigeria with her enormous human and natural resources coupled

with the large inflow of income from crude oil export was primed for rapid economic development. Why did the economy fail to diversify away from a near total dependence on oil but instead produce a weak economic structure that tends to perpetuate underdevelopment? While there is no easily identifiable all-encompassing answer to this poser, this paper intends to add further clues to the solution for this national developmental puzzle.

The remaining part of the paper is arranged thus: Part 2 presents an overview of the Nigerian Petroleum industry while the part 3 looks at the literature of economic development the country appears to be executing. Part 4 discusses the various linkages the Petroleum industry offers visa-vis Nigeria's exploration of their potentials. The penultimate part will offer some recommendation and the part 6 would contain the concluding remarks.

2.0 AN OVERVIEW OF NIGERIAN PETROLEUM INDUSTRY

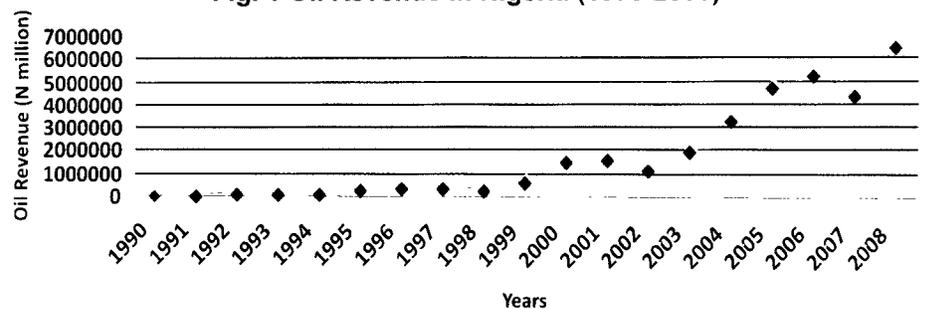
The British discovered oil in Nigeria in 1956 at Oloibiri in the Niger Delta. This discovery was made by Shell-BP which was then, the sole

concessionaire. Pioneer production began in 1958 and this took Nigeria to the rank of oil producers. Since 1970, the extraction and drilling of oil has become the biggest industry in the country. The country was able to reap the riches that came from the rise in the world oil price in 1970 and by 1971 she joined the Organization of Petroleum Exporting Countries (OPEC) and nationalized the oil industry by creating the Nigerian National Oil Corporation (NNOC) via a decree. To further establish control over the industry, in 1979, the government merged the NNOC and Ministry of Petroleum to form the Nigerian National Petroleum Corporation (NNPC).

By mid seventies, Nigeria had attained a production level of over 2 million barrels of crude oil per day (See table 1 in appendix.). As a result of the economic slump in the country in the eighties, the production figure dropped but gradually picked up in the nineties. By 2005, the production level had increased to 2.6 million barrels per day (table 1 and fig. 2).

According to the 2010 BP Statistical Energy Survey, Nigeria has oil

Fig. 1 Oil Revenue in Nigeria (1970-2008)



Source: Central Bank of Nigeria Statistical Bulletin

*The views expressed in the paper are those of the author and do not in any way represent the official position or thinking of the Central Bank of Nigeria. The author acknowledges the comments and criticisms of an anonymous reviewer

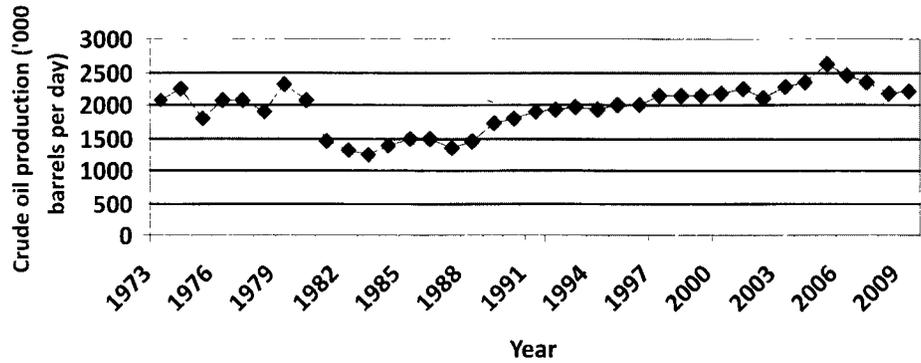
reserves of about 37.2 billion barrels at the end of 2009, representing 2.8per cent of the world's reserves. Nigeria is currently ranked as the 10th most Petroleum-rich nation in the world and one of the few major oil producing nations capable of increasing its output. With this position and depending on the price of oil at the global market, Nigeria is expected to have more external earnings and a better macroeconomic performance. However, there is even an increase in the expense burden on imported refined products to meet domestic demand. This is as a result of the fact that the Nigerian refineries are operating at far below their installed capacities. due to poor maintenance. spate of fire and theft incidences At present the Nigerian government. through the NNPC, has four refineries. with a combined installed refining capacity of 445,000 barrels per day (bpd). These refineries include: the Old Port Harcourt Refinery Company, the Warri Refinery and Petrochemical Company, the Kaduna Refinery and Petrochemical Company and the New Port Harcourt Refinery Company. The table below shows a brief history of these refineries.

The fact that the four refineries are operating below installed capacity is clearly shown on table 3 in the appendix. The inability of the refineries to meet the domestic need for Petroleum products, especially premium motor spirit (PMS), has led to the importation of Petroleum products.

On gas production, according to the same BP Survey, the country has in 2007 a proven natural gas reserve of 5.29 trillion cubic meters representing about 2.98per cent of the world's total. The country's 2007 natural gas production was at 34.97 billion cubic meters, accounting for just 1.18per cent of the world supply. This is mainly due to lack of gas infrastructure and flaring of 75per cent of associated gas which cost the country an estimated \$18.2 million loss daily.

On the fiscal side, in 2002, the World Bank reported that oil accounts for 90per cent of the Nigeria's export revenue and 41per cent of its GDP. It also provides 95per cent of foreign

Fig. 2 Crude Oil production in Nigeria (1973-2009)



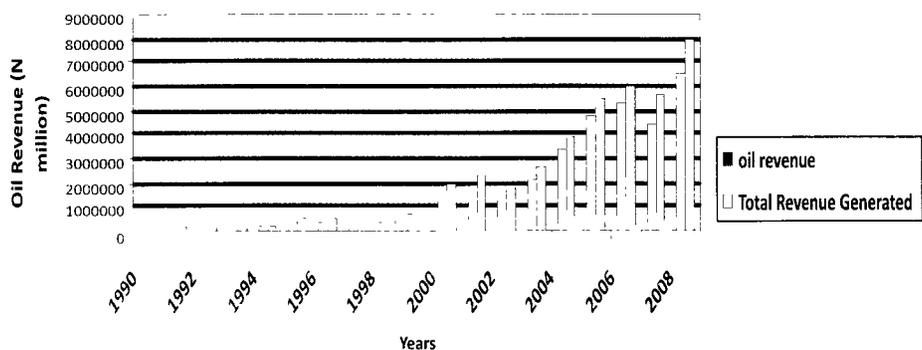
Source: United States Energy Information Administration (US EIA)

Table 2: History of refineries in Nigeria

PLANT	DATE COMMISSIONED	INSTALLED CAPACITY BBL / DAY
First Port Harcourt Refinery	1965	60,000
	1978	125,000
Warri Refinery PLANT	DATE COMMISSIONED	INSTALLED CAPACITY BBL/DAY
Kaduna Refinery	1980	110,000
	1989	150,000
Second Port Harcourt Refinery		
TOTAL		445,000

Source: Dayo, F B. (2008).

Fig.3 Oil Revenue % contribution to Total revenue in Nigeria (1970-2008)



Source: Central Bank of Nigeria Statistical Bulletin

exchange earnings and about 65per cent of government's budgetary revenue. Evidently, Nigeria's consumption and investment is heavily dependent on oil revenue. To provide an insight into how large this industry is, NNPC estimated the industry's investment outlay for 2005-2008 at about \$67 billion.

3.0 Economic Development Models Nigeria's Implied Option

Some development economists believed that instead of seeking a balanced-growth approach to development, it is better for countries to concentrate their efforts on few sectors. This is because once the

leading sector gets established, then, the backward and forward linkage will build up with other industries and stimulate their development. The conclusion is that uneven development must come first and only then can the benefits of growth spread out more widely. The beauty of this approach was first advocated by Hirschman (1958), is that development can be kick-started with little or no market distortions. The recent work by Trindade (2005) which showed how late industrialization of South Korea and Taiwan can be produced through an export promotion policy, gave an empirical support to this argument.

The theory of linkages stresses that when certain industries are developed first their interconnections (or linkages) with other sectors will induce or at least facilitate the development of new industries (Todaro and Smith, 2006). Debraj (1998) listed some criteria under which the key or leading sectors of the economy can be chosen. These include:

- (a) The number of linkages that a given sector possesses
- (b) The strength of each linkage
- (c) The 'intrinsic profitability of each sector (the leading sector may be the least profitable provided it spurs most of the other sectors)

With the near total dominance of the Petroleum industry, Nigeria's leading sector seems to have been naturally selected and widely accepted by successive governments. The Nigerian economy exhibits the characteristics of unbalanced growth with the dominance of the oil and gas sector both in export and earnings (unbalanced growth is a situation in which economic growth is significantly faster in some segments of the economy than others). It is, therefore, expected that with the massive production and exportation of oil and gas, the country's oil and gas industry will provide the necessary linkages for other industries to exploit and expand.

4.0 Petroleum Industry Linkages

The Petroleum industry provides the

following linkages:

1. **Forward Linkage.** Forward linkage occurs when the products of one industry is used as the raw material of another industry. It can involve an industry in primary production linking with an industry in secondary production and occurs when one industry is producing the raw material for another industry (wikianswers, 2010).

Nigeria recognized the importance of the downstream sector of the Petroleum industry which necessitated the building of four government owned refineries with an installed capacity of 445,000 barrels per day. Unfortunately, problems ranging from sabotage, lack of timely turn-around maintenance, poor management and corruption ensured that these refineries operate far below their capacities at times as low as 30per cent of installed capacity. Even the expected emergence of private refineries has turned out to be a mirage as a result of policy issues mostly on pricing. Today, Nigeria imports refined products to meet local demand. It is important to point out that even the advancement of exporting refined Petroleum products cannot shield the economy from the risks associated with exporting products with very high price fluctuation tendency in the world market. The problems with the refineries are also in the petrochemical industries. Nigeria has three petrochemical industries and none is operating near its installed capacity. The failure to establish a functional downstream sector ensured that the key raw materials for plastic, pharmaceutical, fertilizer, lubricants and a host of other industries are imported thereby truncating development, competitiveness and the growth of these industries in the country. As a result of this monumental failure of the state-owned key industries, expected potential gains that would have arisen from this linkage had been lost. Unfortunately, other countries are reaping the benefits of the current

global shortage of refined products caused by strict environmental regulations on the establishment of new refineries in USA and Europe. Today, Saudi Arabia is a major exporter of refined Petroleum products and Singapore with no oil resources is now a major exporter of petrochemical products in the world.

2. **Backward Linkage.** This is the use by one firm or industry of produced inputs from another firm or industry. An effect in which increased production by a downstream manufacturer provides positive pecuniary externalities to an upstream manufacturer.

Nigeria's Ministry of Petroleum Resources estimated that procurements account for 54per cent of \$12 billion dollars that the Nigerian oil industry spends annually. The breakdown of the procurement showed that steel components account for 75per cent of total procurements (Okolo, 2008). The inability of the Ajaokuta Steel Complex to function despite gulping billions of dollars ensured that this ready market for steel with the attendant benefits was lost to foreign firms. The steel industry linkages with other industries like construction, shipping, car assembly plants, etc, were also lost. Painfully, other nations have used this linkage to trigger off development. For example, it is on record that former President, Park of South Korea, in order to create demand for the nation's ship making firm (Hyundai), forced the nation's refineries to ship their oil in Korean-owned tankers. Today, South Korea is one of the leading ship making countries and Hyundai one of the leading conglomerates in the world.

3. **Consumption Linkage.** This is expected when as a result of expanded export, a large segment of the labour force is paid higher wages above their previous rates which induces aggregate demand for a wide range of consumer goods. The

massive earnings of the oil workers, failed to generate this linkage because of the following reasons; first, it is proven that as people's income grow, they intend to spend more on durable consumer goods such as cars, television, air-conditioners etc. Since most of these sophisticated durable items are imported, the local economy loses out on the benefits of this consumption. Secondly, despite the dominance of the Petroleum industry, the sector employs relatively few workers and, therefore, cannot generate the required demand needed to stimulate the production of these durable consumer products locally. Consequently, a large chunk of earnings of Nigerians working in the oil and gas industry is spent to sustain foreign manufacturing firms. This leakage is enormous considering the earnings of the dominant expatriates who spend only their living cost here.

4. Infrastructure Linkage. This linkage arise when the provision of infrastructure for the oil industry can lower costs and open new opportunities for other industries. When an infrastructure is shared, each firm that uses the infrastructure witnesses a decline in the unit cost of production, becomes more competitive, and therefore is likely to be more profitable. The Petroleum industry is quite ineffective as it concerns this linkage. This is because pipelines, tanker ports, oil depots and deep sea ports have no other use outside the industry. In Nigeria, this is critical because as a result of small and scattered nature of the nation's oilfields coupled with the need to ensure adequate supply of Petroleum products in all parts of the country, billions of dollars have been spent over the years to develop and build an extensive network of pipelines to transport crude oil to sea ports and refineries across the country. Unfortunately, this huge capital outlay has no benefit to other industries. Since Petroleum is non-renewable natural resource which faces an inevitable depletion, one wonders what

becomes of this investment when Nigeria finally runs out of oil.

5. Human Capital Linkage

Petroleum industry requires a pool of engineers, scientist, geologists, project managers, ICT experts, welders, fitters, crewmen, divers, etc. Thus, it is expected to stimulate the development of skilled labour in Nigeria. Unfortunately, the multinational corporations seem more interested in 'importing' workers than developing local workforce. The resultant effect is a petroleum industry where the expatriates hold the key positions. Consequently, the expected knowledge transfer from the industry to other industries is quite minimal, therefore, of no significant effect on the economy. Even the government response by establishing Petroleum Training Institute, National Institute of Welding, and Petroleum Trust Development Fund which offers scholarships to Nigerians to acquire advance degrees in Petroleum related studies abroad have not succeeded in wiping away the dominance of expatriates in the industry. It is hoped that the recently signed into law Local Content Bill will be strictly enforced to ensure that Nigerians take their rightful place in the industry.

6. Fiscal Linkage Fiscal linkages could be considered as the benefits to government treasury through royalty, rates and taxes.

It is expected that government can capture a large share of the economic rent from Petroleum export as taxes, dividends and royalties and use the revenue to finance the development of other sectors of the economy. However, the effectiveness of these revenues in stimulating development in the other sectors of the economy is a function of the kind of projects and interventions the government undertakes. In Nigeria, almost all government revenue is exclusively dependent on the oil sector earnings. Unfortunately, these oil windfall earnings were squandered on

wasteful projects, bloated civil services and the rest siphoned into the private bank accounts of the elites. The Federal Ministry of Works and Housing, (2003) reported that all road projects awarded to indigenous contractors by the Federal Government between 1999 and 2003 failed in terms of quality and delivery time. The Okigbo commission that estimated that \$12.2 billion in oil earning disappeared between 1990 and 1993 and the recent Halliburton bribe scandal are all pointers to the chronic corrupt practices of our leaders and the complicity of the multinational corporations in the mess of the sector. While Nigeria wasted her oil earnings, Indonesia used its own windfall to invest in agriculture with the goal of achieving self-sufficiency in rice production becoming today a major exporter of rice. In contrast, Nigeria's rise in Petroleum revenue correlated with a steep drop in agricultural production and exportation. A nation that was virtually self-sufficient in food supply in the 1960s and the leading cocoa exporter became a net importer of food by 1983 and the production of this all important cash crop dropped by 43per cent.

The negative effect on the fiscal operations of nation with a dominant Petroleum sector is that the economy becomes vulnerable to external shocks particularly the fluctuations in the price of crude oil in the international market. So long as international oil prices continues to be a reflection of external factors (political and economic conditions in the Middle East, OPEC actions and inactions, economic and weather conditions of advanced economies, etc), oil revenue projections will remain a gamble thereby making economic planning difficult.

Since most of Nigeria's oil industry output is exported and most of its inputs imported, these linkages are therefore of little impact on the development of other local industries.

5.0 Recommendations

The highlighted weaknesses of the

Petroleum industry linkages in Nigeria made the diversification of the economy and weaning it of its total dependence on crude-oil export the real challenge. To achieve this, it is imperative that the government should take the following suggestions:

- ❖ Government must desist from using oil earnings to establish corporations that can be better run by the private sector. To continue using oil revenue to sustain several inefficient, loss making public enterprises is a great disservice to the economic development of the country.
- ❖ With about 70per cent of the population engaged in agriculture, revitalizing the sector should be in the 'must do' list of the government's poverty alleviation programme. Besides, unlike the Petroleum industry, the agricultural sector possesses a greater linkage with the local manufacturing sector. Indeed, the two sectors are intimately related. It is, therefore, pertinent that the development and expansion of the two sectors should be pursued simultaneously. It is not a coincidence that the world's most efficient and productive farms are found mainly in the industrialized countries.
- ❖ Since the problem of inadequate infrastructure has been identified as the greatest single contributor to the high cost of doing business in Nigeria, the oil wealth should be used to provide private investment friendly infrastructures. The fact that providing all the infrastructural needs of any economy is costly and unaffordable implies that choices need to be made. Adenikinju (2003), reported that firms lost 792 working hours in 1998 as a result of power outages. To effectively tackle the problem of low productivity and low competitiveness of the nation's manufacturing sector, government must take the provision of steady and stable electricity in the country a top priority.

- ❖ Sometimes, projects are second best to policies. New public investment projects in many cases may not be the best contribution that government can make in the quest for development. A good policy is capable of reducing or completely remove the need for certain projects. Policies (not projects) made the massive private sector driven investment in the telecommunication industry possible. The same can be replicated in the power sector if the right policies are in place. Government should, therefore, develop policies and incentives that can attract private investment to the key sectors of the economy. Secondly, new projects that deprive core traditional responsibilities of government (law and order maintenance, road maintenance, teachers' salaries, etc) of essential funds are more harmful

to the economy relative to the specific benefits of such projects.

6.0 Conclusion

What happens to our economy when the recently re-energized American research on developing a commercially viable alternative to gasoline for their automobiles and other energy needs makes a breakthrough? Truly, wealth based on natural resources can be eroded. Guatemala learnt this bitter lesson years ago when their wealth based on the highly prized crimson dye extracted from the insect cochinitilla was almost instantly wiped out when the Europeans invented artificial dye(Ha-Joon Chang:2007). Empirical and theoretical evidence over the years have shown that there is no close relationship between a country's resources and its wealth or GNP. Economies grow when her citizens continuously develop and add new activities to the list of those they engage in. The government

APPENDIX
Table 1. Crude Oil Production ('000 barrels per day)

Year	Crude oil production ('000 barrels per day)	Year	Crude oil production ('000 barrels per day)
1973	2053.16	1992	1943.00
1974	2255.08	1993	1960.00
1975	1783.00	1994	1930.9
1976	2067.33	1995	1992.75
1977	2085.67	1996	2000.53
1978	1895.75	1997	2132.45
1979	2302.50	1998	2153.46
1980	2055.00	1999	2129.86
1981	1433.00	2000	2165.00
1982	1295.00	2001	2256.16
1983	1241.00	2002	2114.86
1984	1388.00	2003	2275.00
1985	1495.00	2004	2328.96
1986	1467.00	2005	2627.44
1987	1341.00	2006	2439.86
1988	1450.00	2007	2350.00
1989	1716.00	2008	2165.08
1990	1810.00	2009	2207.91
1991	1891.80		

Source: United States Energy Information Administration (US EIA)

should, therefore, develop the necessary policies and infrastructures that will encourage entrepreneurship

and investment in new activities. This will foster the much needed diversification of the economy that will

set the nation on the path of industrial transformation.

Table 3:
Petroleum Product Supplies in Nigeria (Million Tonnes) (1980-2008)

Year	Local refineries (million tons)	Imported (million tons)	Total	per cent of local refineries
1980	4.45	2.46	6.91	35.6
1981	6.15	2.08	8.23	25.3
1982	8.29	2.05	10.34	19.8
1983	7.18	3.6	10.78	33.4
1984	6.2	2.68	8.88	30.2
1985	6.41	2.59	9	28.8
1986	9.07	2.89	11.96	24.2
1987	5.84	2.81	8.65	32.5
1988	7.01	1.59	8.6	18.5
1989	8.23	2.05	10.28	19.9
1990	8.67	0.93	9.6	9.7
1991	8.04	0.03	8.07	0.4
1992	8.56	2.15	10.71	20.1
1993	7.29	3.2	10.49	30.5
1994	5.44	2.79	8.23	33.9
1995	6.72	1.51	8.23	18.3
1996	5.44	2.36	7.8	30.3
1997	6.92	1.25	8.17	15.3
1998	5.09	3.69	8.78	42
1999	5.36	2.64	8	33
2000	2.59	7.26	9.85	73.7
2001	6.77	4.47	11.24	39.8
2002	6.86	4.57	11.43	40
2003	7.3	7.18	14.48	49.6
2004	6.31	6.5	12.81	50.7
2005	9.39	6.15	15.54	39.6
2006	6.08	6.49	12.57	51.6
2007	3.3	7.13	10.43	68.4
2008	5.13	5.51	10.64	51.8

Source: NNPC Annual Statistical Bulletin 2005 and 2008

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