The Role of Public Sector Enterprise on Economic Development: A Case Study Of The Nigerian Power Sector (1981-2015).

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13 April 2019

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Abstract

Nigeria today is trapped in a crises of deteriorating economic conditions measured in terms of widespread unemployment, abject poverty, exploitation and backwardness among others. The establishment of public enterprises is to address these problems, therefore this study critically examines the role of public sector enterprise on economic development using a case study of the Nigerian power sector covering periods between 1981-2015. This study employed the Johansen Cointegration test to establish a long run relationship between the variables while the Dynamic Ordinary Least Square (DOLS) estimation technique was used to examine a long run impact between the dependent and explanatory variables. Key findings revealed that an increase in electricity consumption induces improvement in per capita income, whereas, an increase in the rate of electricity transmission and distribution loss induces decline in per capita income in the long run. This study concludes that electricity management would substantially influence economic development process in Nigeria. Therefore, there is need to re-evaluate the current privatization exercise of the electricity sub-sector and improve the generating and transmission capacity of the sector in Nigeria.

Introduction

The significant role of public sector was fashioned in most countries to accelerate economic and social development. Yet an increasing evidence indicates that most public sector enterprises either do not contribute strongly to development or perform their public service functions ineffectively or inefficiently. Policy makers engage in continuing debates over whether or not state-owned corporations contribute to economic and social development, why so many have failed to deliver effectively the services for which they were created, and how their management can be improved. These issues will become more crucial as governments in developing and emerging market countries consider how best to achieve economic and social development in an age of globalization, how to spread more widely the benefits and mitigate the potential negative impacts of international economic interaction, and how to alleviate poverty so that larger numbers of people can participate effectively in productive activities and gain access to social services essential for human development.

Nigeria's power sector had operated for several decades as a state monopoly then called National Electric Power Authority (NEPA) until 2005. NEPA controls electricity generation, transmission and distribution facilities with all the profound problems inherent in public monopoly. This over centralization made it impossible for electricity supply to keep pace with the growth in population and economic activities. Nigeria has the biggest gap in the world between electricity demand and supply, providing its population of over 160 million with less than 4000 megawatts of electricity. In contrast, South Africa with a population of less than 50 million people generates more than 40,000 megawatts while Brazil, an emerging economy like Nigeria, generates over 100,000 megawatts for its 201 million citizens (FG, 2013). Indeed, the gap in the power sector has far reaching implications for improving the business climate, sustaining economic growth and the social wellbeing of Nigerians. About 45 percent of the

population has access to electricity, with only about 30 percent of their demand for power being met (Ogagavwodia, Mattew & Ohwofasa, 2014). The power sector is plagued by recurrent outages to the extent that some 90 percent of industrial customers and a significant number of residential and other non-residential customers provide their own power at a huge cost to themselves and to the Nigerian economy. Installed capacity is 8,000 megawatts, but only 4,000 megawatts is operable of which about 1,500 megawatts is available to generate electricity. At 125 kWh per capita, electricity consumption in Nigeria is one of the lowest in the world (AfDB, 2009). This incapacity of electricity sub sector to efficiently meet demand for electricity has been caused by a number of problems which have been detrimental to economic growth. Therefore, exposition of the role of public enterprise in charge of electricity sub-sector to economic development in Nigeria is the main thrust of this study.

2. Historical Facts of Public Enterprise and the Nigerian Power Sector

The history of electricity development in Nigeria can be traced back to the end of the 19th Century**,** when the first generating power plant was installed in Marina, Lagos**,** in 1898, fifteen years after its introduction in England. Its total capacity was 60kW. After the amalgamation of the Northern and Southern protectorates in 1914 to form modern Nigeria, other towns in the country started to develop electric power supply system on the individual scale. The following major cities thus had a dose of electricity supply in the following order: Port Harcourt in 1928, Kaduna in 1929, Enugu in 1933, Maiduguri in 1934, Yola in 1937, Zaria in 1938, Warri in 1939 and Calabar in 1939.

Having completed the first phase of the power sector privatization process, the Federal Government on November 1, 2013, handed over to private investors the distribution companies (DISCOS) and five generation companies (GENCOS) formerly owned by the defunct Power Holding Company of Nigeria. Five generation companies (GENCOS) and 10 distribution companies (DISCOS) won the bidding. The Bureau of Public Enterprises (BPE) put the total sale figures of both the GENCOS and Discos at $2.525 billion (about ₦404 billion). The GENCOS went for $1.269billion while the DISCOS were sold for $1.256bn. The breakdown of the preferred bidders for the Electricity Distribution Companies (DISCOs) as approved by the National Council of Privatisation (NCP), are as follows: Kann Consortium won Abuja Distribution Company at $164 million; Vigeo Power Consortium for Benin at $129 million; West Power & Gas for Eko at $135 million; Interstate Electrics Limited for Enugu at $126 million; Integrated Energy for Ibadan at $169 million; NEDC/ KEPCO for Ikeja at $131 million; Aura Energy Limited for Jos at $82 million; Sahelian Power SPV Limited for Kano at $137 million; 4Power Consortium for Port Harcourt at $124 million and Integrated Energy Distribution and Marketing for Yola at $59 million.

For the Electricity Generation Companies (GENCOs), the preferred bidders included Amperion for Geregu Plant at $132 million; Mainstream for Kainji Plant at $50.76 million with commencement fee of $237,870,000; North-South for Shiroro Plant at $23.60 million with commencement fee of $111 million; Transcorp/Woodwork for Ughelli Plant at $300 million

and CMEC/Eurafric for Sapele Plant at $201 million. Owners of the generation companies and their partners are as follows: Amperion Ltd, owner of Geregu I Genco has Chief Femi Otedola as the chairman. He is also the Chairman of Forte Oil, a major player in the nation's oil and gas sector. Otedola is financing 57% of Amperion's total equity. Its technical partners are BSG Resources Ltd with 38% and Shanghai Municipal Electric Power Company, 5%. Amperion purchased the PHCN firm for $132 million.

Transcorp/Woodrock Consortium, which acquired the 972mw capacity Ughelli Power firm at $300 million, has Mr. Tony Elumelu as its chairman. He committed $225m fund through debt financing by African Finance Corporation (AFC), UBA and First City Monument Bank. Mainstream Energy Solutions, which got Kainji and Jebba Generation Company (Genco) for N27.2bn ($170 million) has retired Colonel Sani Bello at the helm of its affair. The deal was financed by Guaranty Trust Bank and the African Finance Corporation, AFC. Mainstream will be partnering with a Russian company, RusHydro to acquire the plant. North South Power acquired the Shiroro generation plant at $111.7 million. North-South has Niger state government as one of its owners. Other partners are XS Energy Ltd, BP Investment Ltd, Urban Shelter Ltd, Road Nigeria Plc, China International Water Electric and China Three Gorgers Corporation.

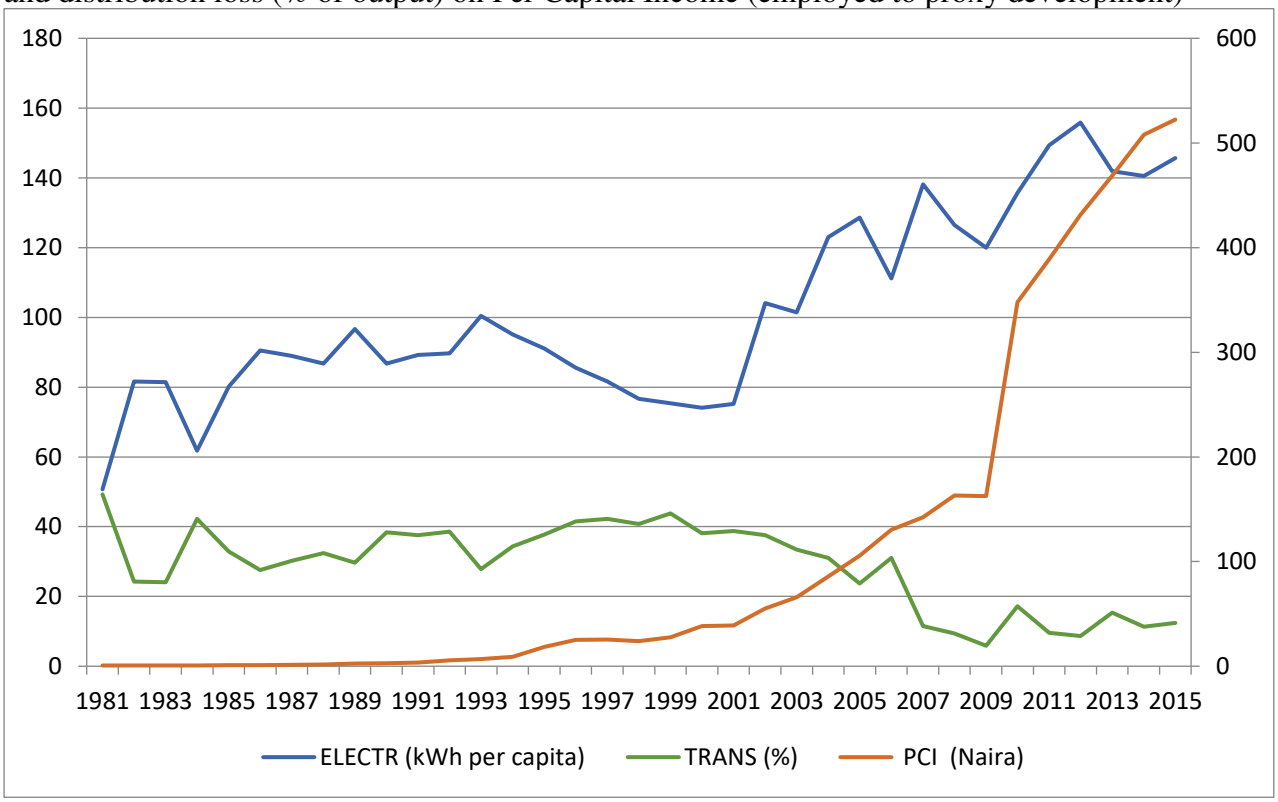
Sahara Energy Resource Nigeria acquired the Egbin Power Station. It is in partnership with NEDC/Korea Electric Power Company (KEPCO), an international investor for $407 million. Sahara Energy Resource Nigeria is owned by Tope Sonubi and Tonye Cole For the distribution companies, KANN Consortium acquired the Abuja Distribution Company (Disco), Vigeo got the Benin Disco, West Power and Gas acquired Eko Disco, NEDC/KEPCO bought Ikeja, while Sahelian Power SPV got the Kano disco. Also, Integrated Energy Distribution and Marketing Company acquired both Ibadan and Yola discos, Interstate Electrics got Enugu, and Aura Energy got the Jos disco while the 4Power Consortium comprising Bayelsa, Rivers, Cross River and Akwa Ibom state governments acquired the Port Harcourt disco. KANN Utility Consortium Ltd won the bidding for the Abuja Distribution Company. The company, a joint venture of Copperbelt Energy Corporation (CEC) Plc and Xerxes Global Investments, acquired 60% of the Abuja Electricity Distribution Company (AEDC) at $164 million.It has CEC Zambia as its technical partner.

KEPCO/NEDC Consortium also acquired the Ikeja Distribution Company at $134.75 million. The acquisition of Ikeja Distribution Company makes it the only investor to have a stake in both the generation and distribution sections of the Nigeria's power sector. It is a partner with Sahara Energy Resource Nigeria in the Egbin Power Station project .Integrated Energy Distribution and Marketing Company (IEDMC), acquired both the Ibadan and Yola Distribution Company for $160 million. It is in technical partnership with the Manila Electric Company (Meralco), the Philippines largest distributor of electric power. The Chairman is Gen. Abdulsalam Abubakar Sahelian Power SPV acquired the Kano Disco for $102 million. It has Alhaji Yusuf Hamisu Abubakar as the Managing Director. Interstate Electrics acquired the Enugu Distribution Company for $106.4 million. It has partners Power House International and Metropolitan Electricity Authority of Thailand as partners. The Chairman is Sir Emeka Offor .Aura Energy acquired the Jos Distribution Company. Aura acquired the distribution

Company after paying $82 million. The Chairman is Alhaji Mohammed Noma**.** 4Power Consortium which was formed by the governments of Bayelsa, Rivers, Cross River and Akwa Ibom states acquired the Port Harcourt Disco (Sunday Trust, 6th, October, 2013).

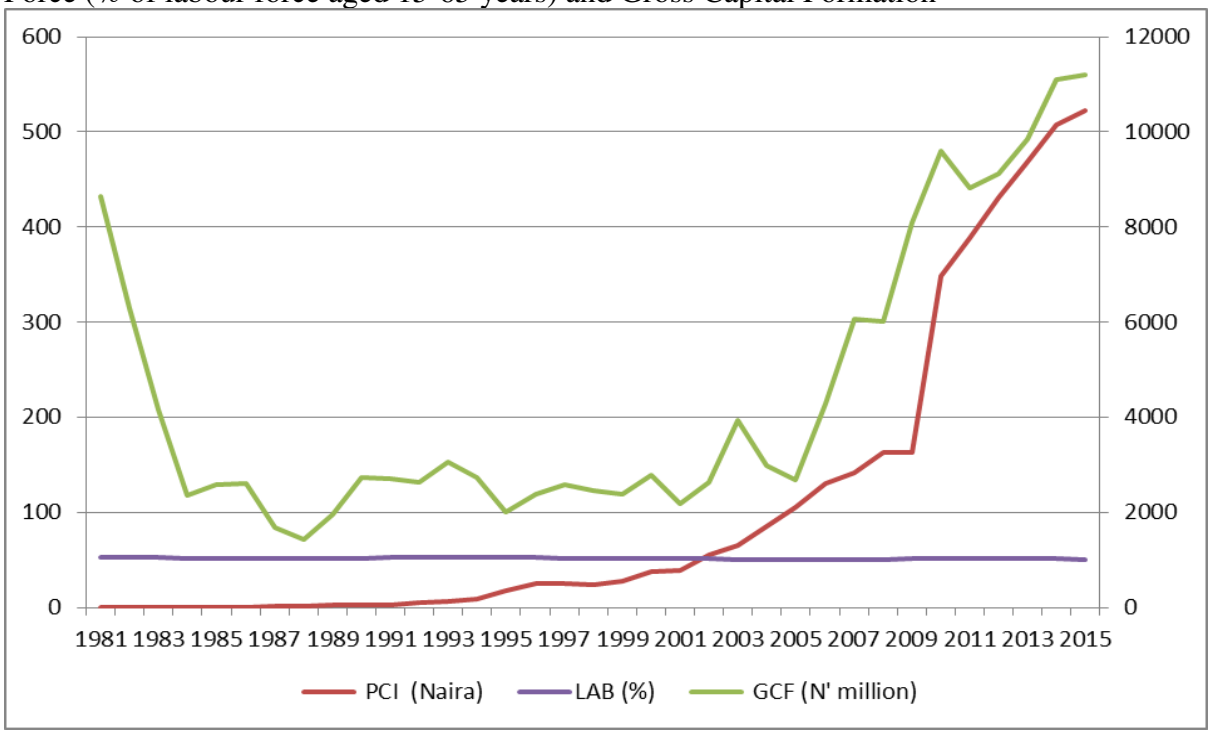
Currently, the Federal Government owns 100% of the transmission company, while its hold on the generating companies is 20 per cent (with 80 per cent of equity sold to private investors) and in the case of the distribution companies, eleven of them that have been sold; government only sold 60 per cent and is still holding 40 per cent. In other words; the transmission company of Nigeria (TCN) is 100 per cent owned, generating companies (GENCOs) 20 per cent owned by government and 80 per cent private sector ownership. For DISCOs, 60 per cent owned by private sector, 40 per cent owned by government. The TCN is controlled by the government (nonetheless, the management of TCN is handled by the Canadian company, Manitoba Hydro Company). On the 30th of September 2013, the Federal Government handed over certificates of ownership to prospective owners. Since then the generation and distribution of electricity have been transferred to the private investors. Meanwhile, a mid-term assistance from the Government is expected to take place later this year. On Wednesday February 12, 2014, the Nigerian Electricity Regulatory Commission at the meeting held with power generating and distributing companies in the country unanimously agreed that the Transition Electricity Market (TEM) idea should be left in the cooler for the meantime. The full impulse of this is that the electricity industry in the country is believed to currently operate in the transition regime (Joseph, 2014).

Trend behaviour of Electricity consumption (kWh per head), Electricity power transmission and distribution loss (% of output) on Per Capital Income (employed to proxy development)



Source: Author's Compilation from Excel

Trend behaviour of Per Capital Income (employed to proxy development, Active Labour Force (% of labour force aged 15-65 years) and Gross Capital Formation



Source: Author's Compilation from Excel

3. Estimation and Discussion of Results

Unit Root Test

The results of the Augmented Dickey-Fuller (ADF) unit root tests statistics shows that three out of the four variables were stationary at after difference while one was stationary at level at 5 percent significant level. Table 1 presents the summary of the results of the stationarity test with their orders of integration which shows that all the variables were I (1). That is stationary after first difference. Since all the variables in the model are stationary at first difference, Johansen test was employed for co-integration.

Table 1: ADF Unit Root Test and Order of Integration

Variables	P-value	Remark	Order of Integration
D(InPCI)	0.0005	Stationary	I(1)**
InPCI	0.6020	Non-Stationary	I(0)
D(InGCF)	0.0071	Stationary	I(1)**
InGCF	0.9315	Stationary	I(0)
D(ELECTR)	0.0000	Stationary	I(1)**
InELECTR	0.1541	Non-Stationary	I(0)
D(LAB)	0.0144	Stationary	I(1)**
InLAB	0.1668	Non-Stationary	I(0)
DTRANS	0.0000	Stationary	I(1)**
TRANS	0. 2376	Non-Stationary	I(0)

Source: *Author's Computation from Eviews 9.0; * *significant at 5%*

4.3.2 Co-integration Test

Table 4.3 present the summary of Johansen co-integration results. This table revealed that the unrestricted trace and Eigen co-integrating rank test rejects the null hypothesis (H_0) of no co-integrating equation and suggests the presence of two co-integrating equations at 5 percent significance level. Therefore, there is a long run relationship per capital income, gross capital formation, active labour force, electricity consumption per person, and electricity transmission loss.

Table 2: Summary of Johansen Co-integration Rank Test Results

Ho	Ha	Eigen value	$\lambda \max test$	$\lambda \max(0.05)$	Trace test	Trace (0.05)
r = 0	$r = 1$	0.810805	111.8312	69.81889**	53.27918	33.87687**
$r \leq 1$	$r = 2$	0.629435	58.55207	47.85613**	31.76725	27.58434**
$r \leq 2$	$r = 3$	0.389518	26.78481	29.79707	15.79218	21.13162
$r \leq 3$	$r = 4$	0.273471	10.99263	15.49471	10.22325	14.26460
$r \leq 4$	$r = 5$	0.023756	0.769379	3.841466	0.769379	3.841466

Source: Researcher's computation (2017) from E-view (8.0) NOTE: (**) denotes rejection of hypothesis at 5% level of significance

Dynamic Ordinary Least Square (DOLS)

The DOLS was employed to evaluate the long-run impact of the independent variables on the dependent variable since Engel-Granger co-integration test confirm the present of long run association of the variables employed. Stock-Watson DOLS model is specified as follows (Gutierrez, 2010);

$Z_t = \alpha_0 + \alpha Y + \sum_{p=-q}^{a} d_j \Delta Y_{t-j} + u_t$

Z_t = dependent variable

Y = matrix of explanatory variables

α = co-integrating vector which represent the long-run cumulative multipliers or alternatively the long-run effect of a change in Y on Z.

a = lag length

q = lead length

The purpose of lag and lead terms included in DOLS regression was to make its stochastic error term independent of all past innovations in stochastic regressors.

Table 3: Summary of DOLS Results

Variables InPCI	**Coefficient**	**P-value**	**Expected Sign**
LAB	-1.1262	0.0003	Positive
InELECTR	7. 2988	0.0197	Positive
InGCF	1.6098	0.0004	Positive
InTRANS	-0.1141	0.0004	Negative
C	8.4995	0.0000	Positive
R-square	**0.800**		
Adjusted R-square	**0.773**		

Source: *Author's Computation from Eviews 9.0*

4. Parameter Significance

The DOLS estimates presented in Table 4.4 revealed that the adjusted R^2 of 0.774 indicates that gross capital formation (LGCF), electricity consumption (LELECTR), electricity transmission loss (TRANS) and active labour force (LAB) (independent variables) in the dynamic model jointly explain 77 percent variations in the per capita income (dependent variable) whereas other variables not captured in this model explained 23 percent variations in the dependent variable. Also, gross capital formation (LGCF), electricity consumption (LELECTR), electricity transmission loss (TRANS) and active labour force (LAB) conformed to the expected sign exerts statistically significant effect on per capita income (LPCI) in Nigeria at 5 percent significant level.

Specifically, 1 percent increase in gross capital formation induces 1.61 percent improvement in per capita income in Nigeria. Conversely, a fall in gross capital formation would dampen the rate of economic development in the country. Similarly, 1 percent increase in electricity consumption induces 7.3 percent improvement in per capita income in the country (as shown in Table 4.4). This is due to the essential influence of electricity usage in the Nigeria economy. Thus, decline in electricity consumption in the country due to fall in its generation would depress the rate of economic development in the country. In fact, at 141 kWh per capita, electricity consumption in Nigeria is one of the lowest in the world. Furthermore, 1 percent raise in active labour force induces 1.2 percent decline in per capita income in the country (as shown in Table 4.4). This inverse relationship could be due to the raising level of unemployment rate among the active age group in Nigeria. Also, 1 percent increase in the rate of electricity transmission and distribution loss induces 0.11 percent decline in per capita income. This indicates when the rate of electricity loss in the country rises the rate of economic development is slowed down.

5. Conclusion

More than a quarter of a century of experience with public enterprise reform suggests that, for a variety of reasons outlined earlier in this study, many Public Enterprise in Nigeria become ineffective instruments of economic and social development. Some public enterprises may be well governed, efficiently managed, and financially sound, but the vast number that have been liquidated or privatized over the past two decades suggests that they were either loss-makers or delivered public services ineffectively. Since electricity management would substantially influence economic development process in Nigeria. There is need to re-evaluate the current privatization exercise of the electricity sub-sector and improve the generating and transmission capacity of the sector in Nigeria. It is a known fact that once epileptic nature of electricity in the country is resolved, the industrial sector would grow astronomically with spillover effect on the socio-economic development in the country.

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