

Does MYTO Tariff Review Impact on the Flow of Private Investment to the Nigerian Electricity Supply Industry?

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Abstract: *The Nigerian economy has been experiencing severe electricity supply crunch which has negatively impacted on the operation of the economy and the people's wellbeing. For decades the industry, dominated by the government SOE (NEPA and now renamed PHCN) provides epileptic service to the economy that has failed to meet the electricity needs of Nigerians. Government introduced industry reform captured in the 2005 EPSR ACT. The reform seeks to open the market for private investment in the generation segment and promote competition with the ultimate aim of increasing generation and supply of electricity to the national economy. To attract the private sector to the Nigerian Electricity Supply Industry (NESI) the government introduced gradual tariff review called Multi Year Tariff Order (MYTO). The paper assesses the impact of MYTO on the flow of private investment to NESI. Questionnaires were used to generate data from sampled respondents. Simple regression analysis was used for data analysis and hypothesis testing. The result of the analysis indicates that tariff review has a positive and significant impact on the flow of private investment to NESI though it explains only about 3% of the variation in the dependent variable (FPI). This shows that investors' response to the government tariff review has been very slow. Government therefore needs to take another look at the current tariff adjustment order (MYTO) as a way of fast-tracking the flow of private investment to the industry for enhanced electricity supply to the Nigerian economy.*

Key Words: *Tariff review, Multi Year Tariff Order, Flow of Private Investment, Electricity Generation, Cost Reflectivity, State Owned Enterprise.*

I. Introduction.

Nigeria's economic stride is greatly hampered by lack of adequate supply of electricity despite the enormous energy potentials of the country (Adenikinju, 2005; Iwayemi, 2008a; FGN, 2010). According to the World Economic Forum Report (2010/11), Nigeria's competitiveness ranking has slipped from 99th to 127th out of 139 countries, due largely to the dismal performance of its electricity industry. Because the operation of the modern economy relies on adequate supply of electricity and at the moment there is a disturbing gap between electricity supply and demand it therefore means that the Nigerian economy is facing a daunting developmental challenge. Electricity infrastructure development used to be financed by the State with the involvement of the private sector as contractors.

There is however an increasing involvement of the private sector in the financing and operation of electricity infrastructure assets especially at the generation end of the electricity industry where the introduction of competition seems feasible as governments face fiscal difficulties and therefore become unable to meet the investment and operational needs of the infrastructure industry. Private sector financing of infrastructure begun in 1982 in Chile with the promulgation of National Electricity Law (NEL) which paved the way for private participation in the Chilean electricity market. Today private sector participation in the development of electricity generation infrastructure is widespread (Estache, 2005).

As Nigeria aspires to achieve rapid economic growth and development, the need to increase electricity supply to the national economy therefore becomes obvious. However increasing electricity supply to the national economy requires huge investment of economic resources which the government could not provide. The alternative is the private sector investment. To attract the private sector investment to the electricity industry, the government enacted the Electric Power Sector Reform Act (2005) to reform the industry and allow for private participation in the generation and sell of electricity. The government evolved a package of incentives to woo private investors to the industry. Pertinent among the list of incentives government offers to the private investors is tariff review. Government has accepted the argument that industry tariff level is not cost reflective making the industry unattractive to the private sector investors. To attract the private sector, the government commits to gradual and periodic tariff review called Multi Year Tariff Order (MYTO) in order to move tariff to the level that allows for the recovery of investors investment and operational costs together with an acceptable margin of profit. The MYTO tariff review is premised on the principles of cost recovery, appropriate investment signals, stability, efficient use of the network, correct risks allocation, simplicity, incentives for improving performance, flexibility and social objectives (Amadi, 2011: 3-4)

The research examines the influence of MYTO in stimulating the flow of private investment for the development of electricity supply infrastructure in the Nigeria Electricity Supply Industry.

1.2 Research Objectives.

The research seeks to identify the contribution of industry tariff review (structure) towards attracting the flow of private investment to the Nigerian electricity supply industry and to proffer policy suggestions on how best to fast-track the flow of private investment to the industry.

1.3 Research Hypothesis

H₀: The flow of private investment to the Nigerian electricity supply industry is independent of the industry tariff structure.

H₁: The flow of private investment is dependent on the industry tariff structure.

II. Literature Review.

There is a mismatch between infrastructure services supply and demand in many African countries caused largely by the fiscal difficulties experienced by these governments and the inefficient operation of most of the SOE utilities that deliver infrastructure services (Estache, 2006a). World Bank (1994) documents the infrastructure services shortage in developing countries reporting that 1 billion people lack access to clean water, 2 billion lack adequate sanitation and that 2 billion people have no access to electricity. Consequently governments initiated the reform of their electricity sector by unbundling the sector, introducing competition, creating independent regulators and open the industry to private participation. (Estache, 2006b). Because investors expect to generate positive returns from their investments, governments usually allow for tariff increase which serves two fundamental purposes: making the industry attractive to the private investors and saving funds for the government that would have gone paying for subsidies. Industry tariff therefore serves as an important indicator of the attractiveness of the industry to potential investors. However prior to reform, in many developing countries where government owned SOE provides electricity, tariff is usually set below cost recovery level. The implication of this is that the SOE is made to depend on government subsidy in order to be able to operate (Estache, 2005). This, it is observed leads to inefficiencies and mounting debts (Adenikinju, 2005; Estache, 2005; Onuaha, 2010). Attracting the private sector therefore is hinged on moving tariff up towards cost recovery level which will enable investors to recover both their investment and operational costs (Baughman and Buresch, 1994; Noel and Brzeski, 2005). However while it may seem to appeal to the investors sentiment, raising tariff to cost reflectivity has to be based on affordability and access considerations otherwise a large segment of the citizens will be priced out of the electricity services (World Bank, 2005; Estache, 2006). In addition, raising tariff to cost recovery usually invite popular public protests that may be politically costly to the government in power especially when an election approaches (World Bank, 2004). To avoid *rate shock* the Nigerian government has developed a gradual tariff review mechanism which it called the Multi Year Tariff Order or MYTO (FGN, 2010).

3.1 Methodology and Tools of Analysis

The research adopts a cross sectional survey research design to undertake the study in line with the work of Adenikinju, (2005); Jamasb, (2005); Kerekezi, (2002); Lee and Anas, (1998); Renieka and Svenson, (1999, 2002); Wallsten, Clarke, Haggarty, Kaneshiro, Noll, Shirley and Xu, (2004); Woodhouse, (2005), (2006) among others. According to Fenton, Johnson, McManus and Erens, (2001:84) cross sectional surveys provide *robust* estimates of the characteristics of the larger population.

The research draws sample from the population of managers of the licensed private firms (often referred to as IPPs). Data were collected from the selected sample through the use of structured questionnaire. The study seeks to examine the state of private sector investment in NESI. It seeks to determine whether tariff review through MYTO has impact on the flow of private sector investment to NESI. The population of the study comprises of higher level managers of licensed private power companies (IPPs) (which stand at 54 as at May 2012) in the Nigerian Electricity Supply Industry. They include the Managing Directors/CEOs, Chief Operation Officers, Directors of Finance of such companies, Assistant Directors Client Services and Procurement, Managers Projects and Managers Sales and Marketing. Others are Managers Operation and Management, Managers Finance and Admin. Managers Client Support and Managers Energy Economics.

From the population of 540 managers the study drew a sample of 230 respondents using the Yamane (1967) formula for normal approximation at 95% confidence interval.

Thus the sample size was arrived at using the below formula:

$$n = N/1 + Ne^2$$

Where;

N = the population size (540)

n. = the sample size (230)

e. = level of precision (0.05)

l = constant

Sample Size $n = N / (1 + N(e)^2) = 540 / (1 + 540(0.05)^2) = 540 / 2.35 = 230$ respondents. Therefore the sample size for the research is 230 out of the population of 540 managers.

Sample for the study was selected through the use of simple stratified random sampling from the population of managers in the licensed private companies in Nigeria. The stratified sampling procedure allows the researcher to draw a sample in such a way that the researcher is assured that certain sub-groups in the population will be represented in proportion to their numbers (Borg and Gall, 1978).

Data were collected through the use of structured questionnaire which were administered to the sampled respondents. The questionnaire was designed using the Likert Scale format. The responses were scored from 1-5 indicating value assigned to each possible answer with 1 expressing the strongest disagreement with the made statement and 5 expressing the strongest agreement (the most favourable impression) with the made statements (Cooper and Schindler, 2011). The choice of Likert scale was informed by its easy construction, reliability, and its ability to handle greater volume of data (Thurstone and Kenney, 1946; Cooper and Schindler, 2011).

A total of 299 questionnaires were distributed to the respondents assuming a 30% non response rate due to the declining rate of survey research response as reported by de Leeuw and de Heer, (2002) As a result 299 questionnaires were distributed to the respondents out of which 215 were returned representing about 72% of the total questionnaires distributed. Out of these about 3 questionnaires were returned unfilled. Closer examination revealed 5 morbidity cases where the respondents tick in one option throughout the questionnaire i. e. ticking strongly agreed, agreed, undecided, disagreed or strongly disagreed throughout the questionnaire.

3.1 Method of Data Analysis

Data analysis was conducted using the Statistical Package of Social Science (SPSS) also known as Special Products for Statistical Services software version 17 which allows for complex statistical analysis of large data within a very short time and relatively easily (Hinton et al, 2004, Pallant, 2011). Descriptive statistics such as frequency distribution , measures of central tendencies (means, mode and median) and measures of dispersion (range, variance, standard deviation ,inter quatile) were used in data cleaning and data preparations preparatory to inferential data analysis as recommended by Coakes ,(2005) , Hair, (2006) , Pallant (2011) and Tabachnick and Fidell, (2007).

Inferential statistics using simple linear regression was used in the conduct of data analysis and hypothesis testing. Regression analysis is a statistical technique used in determining relationship between or among variables. The analysis enables us to measure impact of a change in one variable (Independent Variable) cause a change in another variable (dependent variable). This study however adopts the simple linear regression model where the influence of a single explanatory variable is measured. The influence of the independent variable (tariff review /MYTO) is measured against the dependent variable (flow of private investment).

3.1.1 Data Analysis

A total of 207 were entered into the data file. Each questionnaire was given an ID number for easy identification and correction where necessary. Negatively worded questions (items) in the questionnaire were reversed before the commencement of the analysis as recommended by Cooper and Schindler, (2011), Hair et al (2006), Pallant, (2011), , and Tabachnik and Fidell, (2007)

Model Test Independent Variable: Industry Tariff Structure.

Table 1: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.161 ^a	.026	.020	.77812

a. Predictors: (Constant), ITS

b. Dependent Variable: FPI

Table 1 indicates the model summary of the IV. The model indicates an r value of .161 and R² value of .026. The model shows that the independent variable ITS explains about 3% of the variations in the DV (FPI).

Table 2: Analysis of Variance of the Relationship between ITS and FPI.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.587	1	2.587	4.273	.040 ^a
	Residual	96.875	160	.605		
	Total	99.463	161			

a. Predictors: (Constant), ITS

b. Dependent Variable: FPI

The ANOVA table indicates the significance level of model. The *p* value of .040 is less than 0.05 (*p*<0.05). This shows that the IVs influence on the DV is significant. In other words the influence of the IV on the DV is not by chance.

Table 3: Beta Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.427	.257		9.444	.000
	ITS	.197	.095	.161	2.067	.040

a. Dependent Variable: FPI

Table 3 depicts the Beta Coefficient of the regression model. It shows the values of the intercept and the coefficient of the model.

The above linear regression model is expressed by the below equation.

$$Y (\text{FPI}) = b_0 + b_1 X_1 + e \tag{1}$$

The regression variate therefore becomes

$$Y (\text{FPI}) = 2.427 + .197 \text{ITS} \tag{2}$$

Where Y is the dependent variable (FPI), *b*₀ is the intercept which shows the value of Y when the value of *X*₁ is zero and *b*₁ is the regression coefficient which denotes the estimated change in the dependent variable for a unit change in the independent variable while the *e* represents the prediction error which shows the difference between the actual and the predicted values of the dependent variable.

III. Hypothesis Testing.

The hypothesis to be tested is based on the items on the questionnaire instrument shown in appendix 1. The hypothesis is restated below.

Ho: *The flow of private investment to the Nigerian electricity supply industry is independent of the industry tariff structure.*

H₁: *The flow of private investment to the Nigerian electricity supply industry is dependent on the industry tariff structure.*

The hypothesis was designed to test the relationship between the **Industry Tariff Structure** (the IV) and the Flow Private Investment (the DV) to NESI. It was designed to assess the influence of the prevailing tariff structure in the industry towards attracting private investment flow to the Nigerian electricity supply industry. The hypothesis represents the Independent Variable ITS.

Table 1 represents the model summary which indicates the *r* and *R*² values of the model respectively. The model has an *r* value of .161, and *R*² value of .026 which indicates that the model has about 3% explanatory value. Table 2 indicates the ANOVA value and it shows that the relationship at a *p* value of .040 is significant.

Decision rule:

Reject Ho if *P* < 0.05

Accept Ho if *P* > 0.05

Therefore going by the above stated decision rule the null hypothesis which states that *The flow of private investment to the Nigerian electricity supply industry is independent of the industry tariff structure* is rejected and the alternate hypothesis which states that *The flow of private investment to the Nigerian electricity supply industry is dependent on the industry tariff structure* is accepted.

IV. Discussions of Findings.

ITS (industry tariff structure) sought to test the hypothesis on the relationship between industry tariff review (MYTO) and FPI (flow of private investment) and it demonstrates the positive relationship between the introduction of cost reflective tariff and FPI. Though many studies accept the need for tariff review in order to hasten the flow of private investment to developing countries power sector, they however caution for the tariff review to be gradual, and to reflect the power purchasing ability of the citizens in order not to exclude a large segment of the population from having access to electricity service (Albouy and Bouston, 1998; ESMAP, 2005; Estache, Foster and Wodon, 2002; Haselip, 2004 and Jamasb, et al, 2005).

This finding is consistent with the views of Heron (1985) that unless the governments muster the necessary political will to raise tariff to cost recovery level a country's power sector investment programme will be either constrained or maintained at the expense of government revenues which may not be sustainable in the long run. Heron (1985) stresses the need for cost reflective tariff and cautions that reliance on budget support for financing power investment means that investment often has to be restrained when macroeconomic pressures on the budget become severe. The findings also confirm the conclusion of NEPAD-OECD (2009) that private sector investment flow to the African power sector is slow due to insufficient cost recovery because of low and inflexible tariff. The findings also confirm the view of OECD/IEA, (2007; p25) which maintains that 'when low price caps are used, incentives for investment in power generation are capped with it'. However moving to a cost reflective tariff in Nigeria as in most developing countries has not been an easy task. Ebherad and Gratwick (2012) argue that tariff reform in Nigeria seems unfinalized, an indication of the absence of strong political will on the side of the government to raise tariff, which the government claims was to avoid introducing tariff shock which could potentially harm the consumer (FGN, 2010). At the moment electricity is still subsidized by about 50% (World Bank per com 2011a; Amadi 2011:9). Another important element of tariff is the issue of having a secure and adequate revenue stream which has to do with proper metering, billing and collection of rates which are essential to the cost recovery and the generation of sound return on investment (Ebherad and Gratwick, 2012).

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