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Privatization of Power Sector in Nigeria: An Evaluation of Ibadan and Ikeja Electricity Distribution Companies Performance (2005–2018)

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ABSTRACT

The challenge of stable electricity supply in Nigeria with its harrowing effects on socio-economic development accounted largely for government decision for privatization of the power sector. However, the extent to which this purpose has been achieved requires investigation, which necessitates this study. Survey research design was adopted, with questionnaire administered on both residential and commercial customers of Ibadan and Ikeja electricity Distribution Companies selected as focus for the study. Multiple regression statistics was used for data analysis. The result shows that both distribution companies (DISCOs) have brought no significant improvement to electricity supply going by the quality, billing, coverage, metering, load shedding, and response to customers' indicators. Thus we recommend that DISCOs should source for fund from the capital market in order engender customer satisfaction, inject fund for replacement or upgrade of dilapidated power equipments, provision of meters, especially, prepaid type while government make the business environment convenient for healthy competition and regulation.

KEYWORDS

Privatization; power sector; distribution companies; performance

Introduction

Background to the study

United Nations Conference on Trade and Development (UNCTAD) (2009, p. 59) asserts that “The Nigerian electricity power system, which has been run since 1972 by vertically integrated state-owned monopoly National Electric Power Authority (NEPA), is chronically dilapidated with respect to infrastructure, commercial standards and customer service” This aptly captures the dire state of the country's power sector, thus necessitating government reform programs in which privatization is Kernel amongst other measures.

Omoleke (2011) specifically documents NEPA challenges, before it was structurally transformed into Power Holding Company (PHCN) for privatization, as that of insufficient power generation, poor access to infrastructure, low connection rate, inefficient capacity utilization, and inadequate transmission and distribution facilities among others. The depressive impact of poor electricity supply on social wellbeing and economic growth underscores the criticism of NEPA's on its abysmal performance and increasing demands from customers and stakeholders, including international organizations, such as, World Bank, International Monetary Fund, for its privatization. Additionally at

the domestic level, most of the commissions instituted on the review of public utilities service delivery by the government strongly recommended privatization or commercialization of public enterprises, especially the Onosode commission (Ibietan, 2013). As a result, and, in response to NEPA's performance, privatization of the sector was considered by government as an option.

Firstly, the Technical Committee on Privatisation and Commercialization (TCPC) established by the government in pursuit of the privatization policy partially commercialized NEPA (Zayyad, 1992). It was the first window used to introduce NEPA to business orientation management, which according to Abdul (1992), brought improvement on the facilities, staff welfare and revenue collection. But, it appears this fell short of customers' expectations making it to undergo a review of its management, especially ownership and control. Thus, in 1999, NEPA was not only slated for privatization (Adelaja, 2007), but also Power Sector Reform Bill (PSRB) was signed into law intends to enable private sector involvement in power generation, transmission and distribution. Furthermore, the Bill empowered Power Holding Company of Nigeria (PHCN) as successor to NEPA and unbundled it into 18 companies comprising of six generation companies (GENCOs), one transmission company (TCN) and 11

distribution companies (DISCOs) with National Electricity Regulatory Commission (NERC) as regulatory institution (Onagoruwa, 2011).

In 2013, DISCOs and GENCOs were privatized while TCN was placed under management contract agreement (Enoche, Egware, & Eyakanor, 2015). By these structural changes, PHCN existence ended, NERC fully assumed regulatory roles, and the sector became operational under a liberalized environment and private sector driven at the same time. Expectedly, the public sector bureaucratic bottleneck, managerial interference, and other constraints hampering power sector efficient performance started receiving attention. However, empirical research to ascertain the Nigeria power sector postprivatization performance assessment is lacking in the literature but scanty textual analysis. Thus, this work, using Ibadan and Ikeja DISCOs as focus, examines whether Nigeria's power sector privatization has brought about improved performance of DISCOs in the postprivatization era. The work is divided into seven sections. Following this introduction is the theoretical framework while empirical framework comes after. Method of study takes the fourth section while data presentation and analysis follows as the fifth. Afterward, discussion of findings and conclusion and recommendations account for the sixth and seventh sections respectively.

Theoretical framework

This work utilizes the theory of privatization as appropriate framework for its analysis. Privatization as a concept "has been prominent in international economic and political circles since 1970s" (Omoleke and Adeopo, 2005, p 69). Its origin is traced to United Kingdom (UK) as forerunner in 1970s but became a consuming economic passion under Margret Thatcher's last two terms (Clarke & Chisto, 1993). Put differently, privatization gained prominence as a theory out of UK's adoption and application for economic reformation. Nevertheless, it derives its thrust from neoliberal political-economic orientation. As noted by Muogbo (2013), it is anchored on the benefits of market economy system, especially efficient service, effectiveness and productivity alongside deregulation or liberalization of operating environment. However, to what extent can free market economy bring about efficient private delivery of reckonable performance in every economy without government intervention in the system is a pertinent question that privatization advocates have not provided satisfactory answers to, especially, the extent and limit of public sector involvement.

Nevertheless, Ugorji (1995) asserts that privatization is an acceptable policy states' political economy. This suggests that it has accounted for its global embrace in economic reforms beginning from mid-1980s in some developing economies like Nigeria. Hence, its application to the power sector reforms program by Nigeria government. The anticipated deliverables, more importantly, improved performance of public utilities, to a large extent, informed government's efforts in adopting privatization of the sector with high optimism that NEPA's inefficiency, unprofitable management system, and other shortcomings would become historical narratives. The implication is that new experience, according to Gujral (2013) of reliable power supply, tariffs, efficiency of service, response to customers' needs, used in measuring electricity sector performance, and others, such as metering and extensive coverage areas, would be entrenched. As such, populace expectation of better electricity experience is heightened with believe of its corresponding headlong effect on national socio-economic life.

But, Aluko's (n.d. cited in Muogbo, 2013) averment that private sector inherent efficiency from Nigeria's experience is questionable, because their profit emanated from inflated contracts, patronage and corruption rather than efficient operation and productivity. In this sense, the efficiency performance thesis of privatization seems doubtful in the Nigeria's context, considering her unpredictable political environment that appears to entangle liberal business operations. Can one isolate private operators in the country's power sector from this unwholesome indulgence? It seems impossible because of the shared business environment. Therefore, postprivatization performance of IBEDC and IKEDC in such situations cannot be assumed with certainty and, this, requires investigation.

Empirical review of cross-national postprivatization performance

This section reviews empirical findings of researches on postprivatization performance of both developed and emerging economies with a view to providing insight for this study.

In the study assessing postprivatization of power sector in India by Zafar (2015) titled "Best Practices India Power Sector Restructuring Study: Short Review of Privatisation in Power Sector," the findings of Orissa state Electricity Board Privatisation in 1996, which was the ninth largest state in India, revealed that electrified territory increased by 13 percent, brought cash flow for government and also increased Gross Domestic Product (GDP) by 12% on annual basis (Zafar, 2017: 9). It implies

that government revenue was boosted and more citizens are connected to electricity power as dividends of post-privatization within the state showed positive impact on GDP. Nevertheless, pricing and quality of services among other indices were not included in the research.

The work of Soukaina and Amal (2015) on United Kingdom (UK) titled “The British Privatisation of Electricity Network Industry: The effect of the Electricity Reform on Domestic Electricity Price in the United Kingdom,” shows that the price of electricity was not influenced by privatization significantly and responded to coal and natural gas prices that are exogenous factors as well. While these findings were arrived at from the correlation analysis of domestic retail price of electricity and fuel price, it does not consider the country’s preprivatization pricing that seems relatively stable when compared with developing countries like Nigeria characterized by tariff subsidy from government and poor regulatory environment.

In the assessment of Cameroon electricity sector reform by Pincus (2014) titled “Transparency in the Dark-An assessment of the Cameroon Electricity Sector Reform”, findings show that private sector investment growing the economy was partly achieved while the goal of improving quality of services was not achieved but worsened. Also, increase in access to electricity was attained but competitive pricing was not achieved. Cameroon postprivatization performance, going by pricing, was a failure but more customers are connected to electricity power. Hence its impact on the socio-economy could not have been fully attained since the price does not promote low tariff or production cost.

Nepal and Foster (2016) study of Australia postprivatization power sector privatization experience titled “Electricity Networks Privatisation in Australia: An Overview of the Debate” findings of the comparative study of privately owned and state-owned companies disclosed that private companies tariff is not worse off; they reduced network costs and improved quality of electricity supply and investment without price increase when compared to state-owned companies. In sum, the findings position privately owned firms better in terms of performance than public enterprises judging by fair pricing and quality of electricity supply.

The study of Hashim (2017) on Iraq titled “An assessment of Electricity sector Reform in Iraq” corroborated that of Australia positive gains as it revealed that privatization of the sector brought about a reduction in electricity consumption, curbed energy waste and as well reduced collection fees. Iraq’s experience showcases consumers’ prudent usage of power as part of postprivatization benefits, aside lesser consumption cost to the DISCOs.

From the empirical review, while findings show somewhat positive benefits in most countries, it appears there exist no single study that comprehensively carried out a postprivatization study using the key variables of quality of electricity supply, pricing or billing, coverage, metering, Load shedding and Responsiveness to customers’ needs by DISCOs.

Method of study

This research adopts survey research method and elicits data through Likert 4-type questionnaire from residential and commercial customers of IBEDC and IKEDC.

Population of the study

Residential and commercial customers of IBEDC and IKEDC constitute the population of this study. The industrial customers are excluded because a sizable number of them depend less on national grid for power supply. IBEDC has 1,595,000 (IBEDC prospectus, 2017) while IKEDC (IKEDC prospectus, 2017) has 690,000 total number of both residential and commercial customers respectively totaling 2,285,000.

Sample and sampling method

The Krejcie and Morgan (1970) sample size formula was used to determine the sample for this study. This is shown in Table 1. The sample size recommended by Table 1 for IBEDC and IKEDC is 382 and 384 respectively and both totaled 771. However, because of the large number of IBEDC customers, its sample size was increased to 499 that is by 30% as suggested by Israel (2013). Thus, the total sample size for the study is 881

Table 1. Table for determining sample size of known population.

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2,800	338
15	14	110	86	290	165	850	265	3,000	341
20	19	120	92	300	169	900	269	3,500	346
25	24	130	97	320	175	950	274	4,000	351
30	28	140	103	340	181	1,000	278	4,500	354
35	32	150	108	360	186	1,100	285	5,000	357
40	36	160	113	380	191	1,200	291	6,000	361
45	40	170	118	400	196	1,300	297	7,000	364
50	44	180	123	420	201	1,400	302	8,000	367
55	48	190	127	440	205	1,500	306	9,000	368
60	52	200	132	460	210	1,600	310	10,000	370
65	56	210	136	480	214	1,700	313	15,000	375
70	59	220	140	500	217	1,800	317	20,000	377
75	63	230	144	550	226	1,900	320	30,000	379
80	66	240	148	600	234	2,000	322	40,000	380
85	70	250	152	650	242	2,200	327	50,000	381
90	73	260	155	700	248	2,400	331	75,000	382
95	76	270	159	750	254	2,600	335	1,000,000	384

Note: N is Population Size; S is Sample Size
Source: Krejcie & Morgan 1970

Table 2. Internal consistency reliability result.

Variables	Cronbach's alpha	Items
Electricity supply	0.711	2
Pricing/Billing	0.852	2
Coverage	0.951	2
Metering	0.801	2
Load shedding	0.791	2
Response to customers	0.773	2
Average	0.813	6

Source: SPSS Output Result.

enhancing good representativeness of the population. Also, multi-stage sampling technique was used for this study. At first stage, stratified sampling was adopted to classify the study population into five regions-Ibadan, Oyo, Kwara, Ogun and Osun for IBEDC and business hubs into Abule-Egba, Akowonjo, Ikeja, Ikorodu, Oshodi and Somolu-for IKEDC. Thereafter, Simple random sampling was used at second stage in selecting residential and commercial customers within both companies franchise areas. Questionnaire was administered on the selected areas.

Validity and reliability of instrument

Firstly, logical validity was in ascertaining research instrument. To this effect, experts were drawn from the senior faculty members of the Department of Political Science and International Relations to Covenant University Ota to validate the questionnaire. Cronbach Alpha test, which exceeded 0.7, that is, 0.813 as shown in Table 2, was used to confirm the reliability of the instrument

Method of data analysis

Both descriptive and multiple regression inferential statistical analysis were used as analytical tools for this study. The demographic and respondents data to questionnaire were presented in tables and descriptively analyzed while regression was used to predict the strength of relationship and test the research hypothesis. Noteworthy, IBM SPSS Modellers version 23 was employed for the statistical analysis.

Data presentation and discussion

This section presents biographical and responses of respondents data to questions posed. Afterward, the data was analyzed which provide premises for the research conclusion and recommendations.

Descriptive statistics on the critical parameters for postprivatization performance of IBEDC and IKEDC

Table 3 shows descriptive statistics of responses to post-privatization indicators of electricity supply, pricing,

coverage, metering, load shedding, and responsiveness to customers' needs. These are critical success factors that largely determine the extent of DISCOs performance. While customers either agree or disagree with the questions, it is instructive that most of the items are disagreed with are to varying degrees by most respondents with an overall mean of 1.92 (SD = 0.55). Similarly, from the performance column, it can be inferred that respondents disagreed that they are satisfied with the service of the distribution Companies in their communities. Implicitly, DISCOs performance, judging by the indices, fell short of customers' satisfaction with supply, coverage and load shedding indicating higher abysmally poor performance level. Hence, postprivatization performance fell short of being described as successful making inefficiency prevalent in the sector that suggest that DISCOs lacked required technical, managerial and financial capacity to drive electricity distributions within their franchise areas.

Hypothesis testing

Research hypothesis

The research hypothesis is stated below:

H_0 critical parameters have no significant impact on the postprivatization performance of IBEDC and IKEDC in Nigeria

H_1 critical parameters have significant impact on the postprivatization performance of IBEDC and IKEDC.

Interpretation of result. Table 4 shows the extent to which the variance in the dependent variable of performance outcome is explained by the independent variable (critical parameters or indices measure). The adjusted R-squared that identified the percentage of variance in the dependent variable, explained by the independent variable shows 202 (that is 20.2%) variability of the independent variable that is, indices measures of response to customers load shedding, electricity supply, pricing, metering and coverage. The standard error of the estimate indicates 391012 that signified error term. The Durbin Watson result at 1.719 is within recommended range of 1.5–2.5 validating the result.

Table 5 appraises the statistical significance of the six measures of privatization measures of power sector. ANOVA tests the null hypothesis that multiple R in the population equals 0. Decision Rule: Reject the Null hypothesis, when the significance value is below 0.05. Do not reject hypothesis, when significance value is greater than 0.05.

Table 3. Descriptive statistics for postprivatization performance of the power sector.

Items	Critical parameters for postprivatization performance of the power sector											
	IBEDC		IKEDC		Regional offices				Likert scale			
	Mean	SD	Mean	SD	SA	A	D	SD	1	2		
Electricity supply												
1 We bought transformers and electric poles to enjoy stable electricity supply	3.175	.923	3.057	.913	304	269	104	.913	45			
2 We enjoy longer hour of electricity supply after privatization	2.185	.945	2.208	.912	74	180	293	.912	185			
Pricing/Billing												
1 Electricity bills charged customers are equal to amount of electricity used	1.807	.853	1.759	.865	40	88	280	.865	324			
2 Estimated billing method is used to charge customers in my community	2.430	.989	2.765	.546	156	249	187	.546	140			
Coverage												
1 More customers have been connected by the electricity distribution company	2.865	.895	2.775	.845	155	367	138	.845	72			
2 We enjoy better connections as the community grows	2.052	.903	2.145	.903	69	129	335	.903	199			
Metering												
1 Prepaid meters are available to customers	2.031	.960	1.879	.907	54	149	247	.907	282			
2 There is adequate supply of meters by the electricity distribution company	1.853	.886	1.898	.874	42	117	279	.874	294			
Load shedding												
1 The transformer in my community develops problem every time	2.579	.940	2.816	.961	164	262	215	.961	91			
2 Electricity is shared (rotated) among communities in my district	2.927	.951	2.841	.932	213	303	139	.932	77			
Customers' responsiveness												
1 The distribution company quickly responds to customers' complain	2.187	.961	2.373	.911	66	252	226	.911	188			
2 The distribution company encourages customers to make their complains.	1.903	.918	1.952	.898	46	139	261	.898	286			
Performance outcomes												
1 I am satisfied with the service of distribution company in my communities	1.802	.875	1.819	.866	36	113	259	.866	324			
2 The distribution company by the services provided has shown that they are good in the business of electricity supply.	1.923	.909	2.019	.808	36	155	288	.808	253			

Source: Field survey (2018)

Table 4. Regression analysis between critical parameters measures and performance outcomes.

Model summary				
Model	R	R square	Adjusted R square	Std. error of the estimate
1	.456 ^a	.208	.202	.391012

^aPredictors: (Constant), Customers_Responsiveness, Load_Shedding, Electricity_Supply, Pricing_Billing, Metering, Coverage
 Dependent: Performance Outcome
 Source: Field Survey (2018)

Table 5. Analysis of variance (ANOVA).

ANOVA						
Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	29.168	6	4.861	31.797	.000 ^b
	Residual	110.845	725	.153		
	Total	140.014	731			

^bPredictors: (Constant), Customers_Responsiveness, Load_Shedding, Electricity_Supply, Pricing_Billing, Metering, Coverage
 Source: Field Survey (2018)

Interpretation of result. Table 6 shows that F value is 31.797 at .000b significant level. This implies that critical parameters indicative of postprivatization success factors of the power sector have no significant effect on performance outcome of DISCOs with zero or negligible significant level.

Interpretation of result. The coefficient Table 6 shows the simple model that expresses the extent to which critical parameters of the power sector has an effect on performance outcome and which of the variables included in the model contributed to the prediction of the dependent variable. The tests of Tolerance showing individual values above 0.20 (Menard, 1995) and VIF with individual value below 10 (Myers, 1990) prove that there is no concern of multicollinearity problem. The study is interested in comparing the contribution of each independent variable; therefore, beta values are used for the comparison.

The model indicated that electricity supply had the most statistical significance in predicting performance, recording the highest beta value of ($\beta = .256$, with

Table 6. Coefficients.

Model		Coefficients				Sig.
		Unstandardized coefficients	Std. error	Standardized coefficients	T	
		B		Beta		
1	(Constant)	2.425	.098		24.702	.000
	Electricity_Supply	.256	.073	.400	11.241	.000
	Pricing_Billing	-.129	.061	.149	2.395	.003
	Coverage	.121	.075	.132	2.857	.002
	Metering	.177	.060	.138	3.875	.000
	Load_Shedding	.186	.061	.237	4.139	.000
	Responsiveness to Customer	.124	.071	.143	2.153	.009

Dependent Variable: performance outcome
 Source: Field Survey (2018)

a T_{val} higher than 1.96, Sig. .000 $p < .05$), followed by customers’ responsiveness with a beta value of ($\beta = .224$, T_{val} higher than 1.96, Sig. .009 $p < .05$). Pricing/billing does made inverse significant contribution in explaining performance outcome, as it shows a negative beta value ($\beta = -.129$, T_{val} lower than 1.96, $p > .05$). The regression equation from table 4.10 is:

$$\begin{aligned} \text{Performance outcome Predicted} = & 2.425 + .129 * \\ & \text{electricity}_{\text{supply}} - .129 * \text{pricing/billing} \\ & + .121 * \text{coverage} + .177 * \text{metering} \\ & + .186 * \text{loadshedding} + .224 * \\ & \text{customers' responsiveness} \end{aligned}$$

By interpretation, it means that for every unit increase in electricity supply, a .129 unit increase in performance outcome is predicted, holding all other variables constant. On the other hand, for every unit increase in coverage, metering, load shedding and customers’ responsiveness, there is 12.1%, 17.7%, 18.6%, and 22.4% increase in performance outcome; while for every unit increase in the pricing/billing, we expect an approximately 12.9% decrease in performance outcomes. This means that electricity supply and customers’ responsiveness makes the strongest unique contribution to explaining performance outcome.

Decision. The significance level below 0.05 implies a statistical confidence of above 95%. This means that the critical parameters of the power sector have an effect on performance outcome. Thus, the null hypothesis (H_0) that states that “critical parameters have no significant impact on the postprivatization performance of the IBEDC and IKEDC in Nigeria” was accepted; while the alternative hypothesis (H_1) which says that the critical parameters have significant impact on the postprivatization performance of the IBEDC and IKEDC is rejected. This means that privatization of the power sector does not improve performance of both DISCOs judging by the parameters or variables of Responsiveness to customers, load shedding, supply, pricing, metering, and coverage.

Discussion of findings

Having carried out the descriptive and inferential statistical analysis via regression test, the research at this point reviews the implications of the findings for the DISCOs, customers and the country. The findings revealed that there is low performance of both DISCOs judging by the critical success factors outputs from the earlier series of analysis in section 5.0. This implies that IBEDC and IKEDC, as private firms operating in a liberalized market, have underperformed in providing services to the

residential and commercial customers especially, on electricity supply, pricing/billing, and metering with great implications for businesses' thriving, that is suggesting that poor power supply would make commercial customers seek alternative sources (independent power generator) thereby incurring additional cost of operation with a dire effect on profit margin.

Also, the finding suggests that citizens' welfare promotion through stable power supply to enhance quality of living is undermined and the country's socio-economic development is generally threatened. As such, the privatization theory argument of inherent performance capacity of private sector efficiency, productivity and efficient service by Muogbo (2013) is contrasted and this corresponds with the submission of Aluko (n.d.) that inflated contract, patronage and corruption are the sources of private firms profit in Nigeria and not inherent efficiency. Likewise, while the research finding strongly counterpoint the findings of Hashim (2017), Nepal and Foster (2016) Soukana and Anal (2015), it corroborates, to some extent, Pincus (2014) outcome on Cameroon, especially in the quality of service or electricity supply, pricing and overall impact on the economic growth. One can infer that close corresponding outcome of postprivatization performance of both Nigeria and Cameroon, as revealed in this research and the work of Pincus (2014) respectively, suggest that privatization of the power sector has a fundamental error or poor contextual issue(s) in its application and demands a revision for appropriate implementation in both countries and, perhaps, other African countries that share similar experience.

Conclusion and recommendations

This study examined IBEDC and IKEDC postprivatization performance using critical success indicators of electricity supply, load shedding, pricing metering response to customers, and coverage area. The findings revealed that IBEDC and IKEDC underperformed as a private firms aimed to transform the electricity power sector by bringing their technical, management and financial capacities to bear towards ensuring quality service delivery to costumers.

Arising from the above findings with its implications and conclusion, the study recommends that IBEDC and IKEDC should inject fund for the replacement or upgrade of dilapidated power equipments, provision of meters, especially, pre-paid type while government make the business environment convenient for healthy competition and regulation. Similarly, DISCOs should explore capital market opportunities for funding and improvement of service to customers.

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