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Nigeria's Electricity Power Sector Reform: An Appraisal of Unresolved Issues

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ABSTRACT

Nigeria electricity sector reform was perceived as essential due to its undesirable state, consequently, it was embraced by the populace with a high expectation that it would mark the end of epileptic electricity supply. However, the low level of generating capacity and sanctity of the privatization process alongside the poor quality of distribution companies post-privatisation power supply make one worrisome about the efficacy of the reform. This article, therefore, evaluate germane issues hampering the delivery of positive deliverable especially, that of stable power supply and smooth operation of the sector. The study explores secondary data sources and system theory as the underpinning framework. It found out that capital investment, technical losses, national grid system, enabling environment, high debt profile and politicization of the power sector, amongst others, are challenges besetting the actualization of the reform objectives. Hence, to overcome these problems, the work recommends a holistic liberalization of the sector, proactive regulatory agency, metering of customers and sound economic management to reduce the poverty levels of citizens amongst others.

Keywords: Electricity, Nigeria, Reform

JEL Classifications: H- Public Economics

1. INTRODUCTION

Electricity is a very crucial and indispensable factor to a country that aspires a greater social and economic development. In the real sense, its level of output and stability largely determine the degree of other sectors of the economy efficiency since it is highly instrumental to their optimal functioning. In Nigeria, avers that this provides a rationale and basis for the government involvement in the power generation and distribution (cited in Okafor et al., 2015). Implicitly, Nigeria government acknowledged the strategic position of electricity to industrial, commerce and social advancement which are profound to improving citizen's quality of living.

The Nigeria government quest at ensuring the attainment of both the internal and external objectives of reform, identified by Renewable

Energy Education Program/United International Development Organisation (REEP/UNIDO) (2008) within the domestic context, enacted Power Sector Reform Bill (PSRB) in 2005, which enabled the private sector participation in the generation, transmission and distribution of electricity, establishment of National Electricity Regulatory Commission (NERC) as regulatory agency and Power Holding Company of Nigeria (PHCN) as successor to National Electricity Power Authority (NEPA), the monopoly public enterprise operator of the industry value chain. Moreover, PSRB also unbundled PHCN into eleven distribution companies (DISCOs), six generating companies (GENCOs) and one transmission company (TCN) (Onagoruwa, 2011).

Though PSRB was necessitated because the NEPA's commercialization in 1989, as part of the Structural Adjustment

Programme employed to enhance its performance, seem to make a negligible impact on the effective and efficient services delivery to the increasing customers. Consequently, it is noteworthy that in 2013, the DISCOs and GENCOs were privatized while TCN operates under a management contract agreement (Enoch et al., 2015). This was novel, unprecedented and marked a watershed in the annals of the electricity industry in Nigeria, particularly the structure and management system as liberalization was enthroned in lieu of total monopoly and non-competitive market.

Interestingly, Tinuoye (2017, p. 2) asserts that the Nigeria electricity sector reform is “one of the boldest initiatives globally.” However, the low level of power generation in Nigeria which fluctuates between 3500 and 6000 megawatts with the population of over 180,000, while South Africa with approximately 52,000,000 population has attained 40,000,000 megawatts (Gberebie et al., 2017) appears paradoxical and unlikely to yield the concomitant dividends of the reform exercise. Additionally, consumers' post-privatisation era bold reservation on the quality of services of DISCOs coupled with the national legislature demand for the review of the privatization process hinged on the manner in which the that of the DISCOs and GENCOs were carried out (Okechuckwu, 2017), spring worrisome and makes one to doubt the actualization of the reforms lofty objectives.

Therefore, the seeming conflicting circumstance surrounding the reforms motivates this research. The work is aimed to unravel challenges entangling the optimal realization of the power sector reform benefits. To achieve this, credible secondary data sources were explored and descriptively analyzed. The article is divided into five sections. The first section offers the background to the study and followed with the review of literature while the third section provides the theoretical underpinning for the study. Section four discusses the challenges of the reforms with a critical evaluation of the issues and the last section concludes the study and offers recommendations.

2. LITERATURE REVIEW

2.1. Rationale and Objectives of Electricity Power Reform

The reforms of the most sector of the economy are often motivated by consumers' experiences of lackluster performance of organizations especially, the State Owned Enterprises (SOE). Hence reforms are primarily undertaken to engender efficiency. Hartley (2012) argues that efficiency is the most important reasons necessitating the reform of the electricity industry. Therefore, to a large extent, the supply of quality power to customers informed the power sector reforms across countries, underscoring the basis, the overarching objective which could not be divorced, as it appears, from that of enhancing service delivery to customers. In other words, improved organizational performance is kernel to reform among other possible purposes.

Meanwhile, a number of factors, both external and internal, have been identified as more compelling reasons warranting electricity sector reform, not only in Nigeria but Africa continent. REEP/UNIDO (2008) maintain that African countries external

and internal basis ranges from lack of required technical and management capacity of state and private firms, efforts by government to mobilize investment capital needed to foster competition, introduction of new tariff regime, move to minimize government's regulatory function, the sector investment and fiscal constraints, and response to international investment climate, structural adjustment, and global economic reform.

It is discernible, in this sense, that many African states owned and manage power industries through SOE that is bereft of competent talents, especially as technological advancement drives the sector with high speed; there is lack of adequate financial capital to grow the business. These warrant the need for the government to seek external assistance as regards technical know-how and human and financial capital. But, it seems to expose or make the sector susceptible to the global economic vagaries, operators' unethical indulgence alongside highly competitive environment that is almost too formidable for African slow-growth economy advantage. As such, could that not hurt the reform net beneficiaries – citizens, Small and Medium Scale Enterprises - in terms of tariff hike, since privatisation of the industry value chain (GENCOs TCN and DISCOs) constitutes an integral part of the reforms? It is worthy of note that when there exists a weak regulatory institution, the adverse effect would be compounded and become more weighty on the customers.

Moreover, Hartley (2012) identifies technological changes affecting all countries alike, as largely responsible for the pervasiveness of the electricity sector reforms. This suggests that fast-paced of technological innovations or developments spread fast and greatly influence the sector's operation and operators' management strategy alike. But how realistic this is in a world where patents are sought to protect innovations, and a usurious price is associated with such when it is open up for market? In such a situation, developing countries often appear to come last in the list of those that eventually access the equipment as least desirable destinations for investors' huge risk commitment. Be that as it may, the positive weight of the reform, orchestrated by technological progress, might make less impact in a country like Nigeria having operators with the evident of an inadequate capital base to acquire trendy equipment.

On the objectives the reforms are designed to achieve, they appear to be somewhat similar but with little variations across countries. Pineau (2014) highlights six objectives of Cameroon government and World Bank as growing the economy via the private sector and benefit from their expertise, improve quality of service and to increase citizens access to electricity; supply electricity at competitive price; to take advantages of hydraulic resources in the state; and involving the national private sector's participation in the sector. From the stated objectives, one can infer that both local and global considerations, borne out of external influence, constituted the purposes to be achieved. Thus, conflict of interest between the internal and external factors is not unlikely.

However, in Nigeria, the academic, administrators and operators have identified similar central objectives as the rationale for the sector reforms. Kadiri et al. (2015), Iseolorunkanmi (2014)

amongst other contend that the power sector reform is meant to achieve, first, reduced cost of production; second, foster national electricity market development; third, end epileptic electricity supply; fourth, attract new investors to the sector; and fifth, improve the generation transmission and distribution network in order to meet up with the required global standards. These objectives, as they appear, are Idyllic with shared features of factors noted by REEP/UNIDO (2008).

Nevertheless, the common denominator Nigeria's objectives shared with Cameroon are improving the quality of electricity supply through the instrumentality of privatisation, liberalisation and a competitive market. These appear as the pulse beat of both countries electricity reforms programme. Therefore, while Cameroon was unable to achieve these objectives except engaging the private sector in the industry (Pineau, 2014), having an insignificant effect on consumers' welfare, Nigeria's experience, more importantly on the teeming customers seem yet to be proven positive because of the myriad of stymie. On this ground, challenges that bedeviled the actualization of the electricity reform would be unveiled and addressed tactically.

3. THEORETICAL FRAMEWORK

System theory is adopted as an anchor for this work. The theory origin is traceable to the biological science scholar, Ludwig von Berla, highlighting human body functioning base on differing organ inter-dependency, stressing a necessity for inter-disciplinary synergy for cross-fertilisation of ideas as the panacea to common predicaments (Olaniyi, 2001). Put differently, it suggests a symbiotic relationship existing in micro and macro levels of machines, humans, and society. Further, Mayrhofer (2004) maintains that system theory developmental stages is influenced by the trio of machines as its foundation, cybernetics that reveals the influence of environment on the steering of systems, and non-linearity, which reveals the unpredictability of some system due to their specific characteristics. By implication, industrial revolution leading to the invention of machines took its cue from the harmonious nature of the human configuration, its origin in the first place, before its applications spread to the behavioural sciences and contemporaneous disciplines.

Moreover, the theory posits that the system comprises of sub-systems that are not only inter-related and interdependant but also make it function via their contributions (Akinboye and Ottoh, 2007). As such, an alteration of a sub-unit working would, invariably, disrupt the degree of the entire system functionality, possibly lead to its collapse or ground the system. Hence, ensuring a healthy state of the sub-systems largely guarantees a harmonious and compact running of the system, making it capable of meeting the intended purpose (s). Also, it takes, as it seems, maintenance of the component sub-system or units to sustain the performance of the whole (system). The essentiality of this is predicated on the cybernetic nature of the system that permits feedbacks, like a communication channel, from the environment receiving the output.

The electrical power sector is an integrated network comprising of three value-chain of generation, transmission, and distribution.

While the power generation takes the lead, the transmission collects for onward supply to the distribution who distribute to end-users making none of them indispensable and transmission and distribution the transportation mediums between the generation and consumption. Therefore, the electricity sector is system-like, having the generation, transmission and distribution as the inter-dependent sub-system. The contribution of each is essential for the inter-dependent operation cum sustenance of the sector and, a disturbance in any of them, would hurt the smooth functioning alongside its effectiveness and efficiency, more importantly, the delivery of a qualitative and reliable electric-power-output to consumers.

In Nigeria, the power sector reform was embarked upon with the ultimate purpose of ending the unstable supply of electricity to consumers. But, the extent at which the reforms have been able to transform the value chain sub-components-generation, transmission and distribution-optimum performance towards meeting the stated goals especially qualitative electricity supply, with the non-holistic privatisation of the transmission sub-unit of the system, constitute a great concern. In addition, a misalignment in inter-dependent sector between the ownership, equipment capacity, and human competency among the sub-units would threaten the sanity of the system functioning as well as its maintenance and sustenance. It is imperative to know this has generated knotty issues in the post-reform era in the Nigeria electricity sector in this work.

4. ELECTRICITY POWER SECTOR REFORM UNRESOLVED ISSUES

Efforts to bring drastic changes in Nigeria electricity power sector have occupied the national frontier since 2005 when the bill providing the legal framework was passed into law. The unprecedented steps bestir hope for stable electricity supply in the consumers, that is, Residential, Commercial and Industrial. However, while concretization of the customers' expectation seems to remain in abeyance, a number of factors are identified as obstacles to its actualization. These are challenges that are yet to be resolved in the national bid for a transformed electricity sector. The paper situates them under three broad headings of technical, socio-economic and political issues with a view to eliciting their relatedness and make easy for concise analysis.

4.1. Technical Challenges

Issues bordering on operators, equipments, and skills in the industry value chain are identified and analysed under the technical problems with an emphasis on shared relationship in the industry network.

4.1.1. Infrastructural investment

According to Ejoh (2018), 13 years after the commencement of the reform and 5 years of post-privatisation regime, 2.4 trillion Naira (approximately 60 billion dollars) investment worth is required to revamp the decayed infrastructure in Nigeria. This queries the financial capacity of the private operators, especially the DISCOs and GENCOs that assume ownership and managers position of

the privatized PHCN. In this sense, maximization of inherent potentials, upon which the sector present and future potency and forecast could be predicated, is under threat. Be that as it may, one is left but with little wonders at Enoche et al. (2015) striking assertion that the sector reform has failed to bring noticeable changes to the challenges of a high cost of power generation, weak transmission system and effective distribution network. In other words, the value chain private investors have not actually imprint any semblance of innovative managerial competency, hence, appear as grossly incapable of circumventing the huge investment capital demand for the sector buoyancy.

4.1.2. Technical losses

The Nigeria electricity power sector is associated with a high level of technical loss emanating from, first, differences between installed and generation capacity due to shortage of gas supply to power the thermal stations; second, the loss to transmission in the course of conveying power to distribution injection stations; third the distribution losses to customer theft and pilfering (Tinuoye, 2017). It is apparent that energy losses characterized the sector's value chain. Specifically, Adesina (2016. p. 12) avers that the losses are high at 50%, which is above the 21% pre-reform era. Hence, it suggests that the degree of Aggregate Technical, Commercial and Collection losses inherited by private players were only not mitigated but also aggravated in the post-reform regime.

In addition, it seems paradoxical, as noted by Emodi (2016), Oyedepo (2012) that the country abundant oil reserves and renewable energy sources, such as biomass, wind, hydro and wind effect are inconsequential on the electricity power generation capacity. The generation capacity remains under 7000 mega watt (Nnodim, 2018). Based on this prevailing situation, one cannot but argue that the endowed resources were underutilized, modern equipment was not employed by operators and there is absence of political will by the government to drive the sector by ensuring the prevalence of the two mentioned situations that is capable of changing the current status. It is imperative, in this regard, to inject a new technical life into the sector which, to a large extent, is dependent on the entrenchment of a high technical structural operational system in the industry, for this adversarial trend to be terminated.

4.1.3. National grid system

A national grid transmission method of generated power for distribution seems to obstruct effective and efficient management of the sector value chain. Tinuoye (2017. p. 4) notes that 90% of electricity output in Nigeria is supplied via the national-grid to the end-users. Invariably, the nation plunges into a power supply crisis whenever there is any occurrence of a transmission hitches especially, grid collapse and drop in the generation capacity. The GENCOs are, to some extent, deprived the benefit of exploring alternative transmission options, such as, micro-grid, small-grid or off-grid system which consequently increase their investment risk. Similarly, GENCOs become more susceptible to business hazard because of the inability to determine, independently, would-be customers and likewise bargain for price from a vantage position. Generally, this appears to discourage competition, an amiable virtue of liberatisation, and portrays the reform as being averse

or antithetical to eliminating the natural monopolistic tendency inherent in the sector.

4.2. Socio-economic Challenge

Social and economic problems are also noticeable concerns of the power sector reforms. These are likewise highlighted and discussed.

4.2.1. Conflicting priority

Investment is a profit-driven venture. Expectedly, returns on investment occupy one of the most important positions of business purposes. Therefore, the involvement of the private sector as a key driver of the power sector reform programme cannot be isolated from the profit motive. However, it is disturbing when investors discounted or failed to grasp the peculiarity of their sector of interest. This seems to be the case in Nigeria as averred by Kadiri et al. (2015. P. 6) that "One of the biggest challenges in any privatisation is ensuring that necessary investments are made by the private sector/new owner because mostly at times, the investors focused more on aggressive revenue generation than on developing the business..." A misplace of priority of the short-term profit driven by investors in a capital intensive electricity sector for a long term national overall economic benefit appears as the orientation guiding the operators. Thus, the fact associated with the sector as requiring high capital investment for equipment upgrade and procurement of state of the art facility, that made it almost impossible for investors to recoup invested capital or obtain an immediate profit on investment within few years of investment, is been discountenanced.

Therefore, to forestall such occasion, a proactive regulatory institution appears paramount. The onus is on (NERC) in this regard, to tactically engage investors to come to terms with the reality in other to ensure compliance with the signed terms and conditions of operation and not slacking in enforcing the rules when violated. But, where competent independent institutional framework manned by skilled personnel is absent, hardly could the sector's business environment enabled the emergence of decent operators in the industry.

4.2.2. Enabling environment

Facilitating operators' activities toward the attainment of the sector's goals fall within the primary responsibilities of the country's Federal Government as superstructure. Tinuoye (2017) maintains that severe cash flow constraint threatens the financial viability and practically repels new funding into the sector. It implies that the existing financial investment in the sector appears inadequate to raise the performance capacity of operators across the value chain. In effect, a sub-optimum operation exists, likely partly accountable for the GENCOs, DISCOs and TCN limping performance, making the situation demands a sound economic management by the government to stabilize key economic indicators, such as exchange rate, ease of doing business, in other to attract both local and foreign financial capital together with fresh investors simultaneously.

Nevertheless, it is noteworthy, as posits by Iseolorunkanmi (2014) that Nigerian banks made available 70% of loan fund

of N404 billion (approximately 1.2 million dollars) paid for the acquisition of the electricity asset and still look up to them to finance rehabilitation expenditure. Though it may be contended, but, it seems the sector's investors place the cart before the horse by borrowing from the domestic financial institutions to bank-rolled their purchase of PHCN unbundled DISCOs and GENCOs entities instead of sourcing within and or externally before returning to the home for maintenance/upgrade support funding. Additionally, it might be difficult for local banks to show a strong commitment to the sector funding given the present huge capital injected with uncertainty surrounding the renewal of GENCOs and DISCOs licenses aside pressure from the government on them to support agro-business, manufactures of small, medium and large scales. As such, government deliberate support stands as a necessity even though investors also have to look beyond both domestic banks and government for funding if the dangers portend by prevailing poor capital base to the sector viability and environment are to be frontally tackled.

4.2.3. High poverty tackled

One of the fears expressed by consumers about the privatisation of the power sector is a likely high tariff. This is borne out of uncertainty surrounding the customers' ability to pay especially, the residential customers, due to an increasing level of poverty in the country. It is believed that the resultant effect of poverty, account in part, for the high rate of sharp practices such as meter by-passing and similar indecent acts. The fraudulent indulgence by customers, according to Kadiri et al. (2015) and Iseolorunkanmi (2014), is very pronounced in the sector from the pre-privatisation to post-privatisation regime. Whereas poverty level, if not confronted, weakens consumers' purchasing power, the illicit practices short-changed the DISCOs with a multiplier effect on the entire sectors' operation.

4.2.4. Debt profile

A high debt profile has been trailing the sector from the pre-reform days till the present time. The GENCOs, TCN and DISCOs have raised, many times, the seismic adverse consequences of debts on their operations. For example, Adesina (2016. p. 13) avowed that the GENCOs have an estimated 100 billion accumulated debt from 2013 to 2016 impacting on their abilities to pay gas suppliers. Also, the "legacy debt" of the government Ministries, Department and Agencies (MDA) to DISCOs has kept rising even after the privatization of the DISCOs. If one would imagine the spiral effects of the DISCOs debts on the sector value chain, as the contact point to the customers, and the failure of GENCOs to generate power due to non-supply of gas arising out of indebtedness, then the urgent attention the situation calls for to salvage an imminent financial crisis cannot be overstated.

4.2.5. Tariff and billing system

One of the anticipated benefits of the electricity sector reform is the allowance of the industry's private enterprise managers to fully realize an optimum potential via cost-reflective market price (Ochugudu and Onodugo, 2013). However, Okafor et al. (2015) argue that the sector post-privatisation era is confronted by regulated and low tariff regime, leading to poor return on investment. In essence, the sector is far from being under the free market order

where electricity price is determined largely by the market forces of demand and supply. This seems to make private participation not to be fully explored and denied her of exploiting the potentials in the sector and consequently, making it functions sub-optimally.

Furthermore, the Multi-Year Tariff Order (MYTO) billing system, premised on customers' number, AT&C losses, generation capacity, capital expenditure (CAPEX), inflation exchange rate, gas cost, DISCOs fixed and variable cost, generation cost and transmission losses, is not truly cost-reflective because of the model wrong assumptions (Adesina, 2016). Since MYTO billing system is used to arrive at "estimated billing" for unmetered customers, the humongous controversy this has generated between the DISCOs and consumers makes one not to almost concede to the 'non-transparency' of the model submission. Table 1 shows metering and billing as first and second respectively on the category of complaints in 2017 third quarter according to NERC. Unless Meter Asset Provider (MAP) arrangement by NERC, which is aimed at the metering of customer with pre-paid meters according to Nnodim (2018), is expeditiously implemented, controversy about tariff and billing would not only linger on but make "inefficiency" a sobriquet of the power sector.

4.3. Political Challenge

Aliyu et al. (2015) Submit that government officials' non-transparency and credibility have made many potential investors doubtful of her commitment to the electricity sector reform, and consumers likewise on genuine intention to deliver their promises. With little or no doubt, the assertion conveys a politicisation perception by stakeholders of the reform, more importantly, the privatisation of the GENCOs and DISCOs.

Corroborating this, the Socio-Economic Right and Accountability Project (SERAP) (2017) argues in her report that needless political considerations of political leaders are major challenges of the sector privatisation exercise resulting into insufficient transparency of the bidding and award processes; manipulations of rules and disregards for existing laws, emergence of companies without experience in the power sector, management and payment capacity; and Bureau of Public Enterprises (BPE) encouragement of payment deferment and restructuring of payment terms which contravenes the bidding rules and to the disadvantages of other bidders. Evidently, there are incidences of politics and compromise in the management of the electricity sector reform. The unavoidable consequent is the natural distraction or discouragement of both existing and potential investors from considering Nigeria as a verdant investment destination because of the unpredictable

Table 1: Category of customer's complains (Third Quarter 2017)

Disco	Percentage
Billing related	27
Interruption	21
Metering	33
Disconnection related	6
Delay in connection	1
Load shedding	2
Voltage	3
Unsatisfactory service (Others)	7

Source: NERC 2017

business environment, with the political indicator as a critical determinant in decision on where to invest.

5. CONCLUSION AND RECOMMENDATIONS

Nigeria electrical sector reform was birthed as a necessary measure deploys to transmogrify the ailing industry. While the policy was greeted with hoopla, populace expectation of reliable power supply raised, it was nonetheless entangled with many besetting challenges. The harrowing effects of the technical, social, economic and political problems enervate the positive deliverables and thus extenuating its impact while eliciting the systemic nature of the sector operations at the same time in relation to the system theory. Hence, the purposes underlying the reform were undermined making a marginal difference or indifferent to exist between the pre and post-reforms regime performance. Likewise, the objectives identified by REEP/ UNIDO (2008), Iseolorunkanmi (2014) Pineau (2014) and Agbaje and Alabi (2015) as noble as they suggest received a cavalier approach in its pursuit from the Nigeria government. Therefore, this article considers it imperative to strengthen the reform through the discussed recommendations below.

First, holistic privatisation should be made applicable to the sector. In this regard, government ownership of TCN needs be jettisoned to fully accommodate liberalization tenets and flourishing of a competitive business environment in the industry. Hopefully, the brusque perception of some foreign investors about the country's industry milieu would somewhat change and thereby enhanced its prospect. Second, NERC, the regulatory agency, needs be made proactive, autonomous and alive to her duties. The agency should pay close attention to operators' compliance with the rules, terms, and conditions guiding their operations without shirking from the rules enforcement responsibility.

Third, MAP programme should be implemented with immediate effect to ensure customers pre-paid metering and subsequently, nip the problem of billing and high debt profile in the bud. In addition, the financial capital gap would be filled, to some extent, as customers pay for power consumed promptly leaving no room for post-paid arrangement. Fourth, the government, as the country's managers, should intensify efforts to alleviate poverty in the country so as to empower the masses as customers, one that can afford electricity purchase and not just electricity consumers. Lastly, the stability of the polity should be vigorously pursued to guarantee a predictable political milieu such that is attractive to both domestic and foreign investors.

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