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Review

An analysis of electricity market structure and its implications for energy sector reforms and management in Nigeria

Wakeel A. Isola

Economics Department, University Lagos, Lagos, Nigeria
Email: isolawak@yahoo.com

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The paper examines the challenges and prospects of power sector reform in Nigeria by employing a purely descriptive analysis. The focus of exposition is on the market structure, market design and supply gap in the electricity generation within the context of power reform. The paper adopts oligopolistic game theory based models of Cournot, Betrand and Supply Function Equilibrium to explain the complex interest groups in Nigeria energy sector and relate them to experiences in other countries. The paper concludes with a number of suggestions that can move the power sector forward from its lack luster performance of the years.

Keywords: Electricity, Game theory, Nigeria

INTRODUCTION

The electricity industry has witnessed a profound growth in the last few decades across the globe. A noticeable feature of this growth is the deregulation of the sub-sector, which used to be a monopolistic and state owned parastatal to a more vibrant oligopolistic market structure. The pace and magnitude of the trend has been remarkable and, by the end of 1990, the majority of Organisation for Economic Cooperation and Development (OECD) countries and over 70 developing and transition countries had taken some steps towards reforming their electricity sector Bacon, (1999). Perhaps, the advancement in technology coupled with the change in economic perception must have accounted for this feat

However, the motivation for electricity reform differs considerably among developed and developing countries. In developed countries, the principal aim has been to improve the economic and financial performance of the sub sector. However, in developing countries and transition countries, macroeconomic conditions played a rather critical role. This is obvious as many governments are no longer willing or able to support the burden of subsidies, low service quality, non-collection rates, higher network losses and poor service coverage. Following the implementation of Structural Adjustment Programme (SAP) in 1986, which has commercialization and privatization of public utilities, as one of its cardinal goals the Federal Government has put in place a number of measures to revamp the power sector in Nigeria. In 1988, for instance, the National Electric Power Authority was commercialized, with that the organization was able to

review its tariffs upward and in 2005 a new bill- Electricity Power Reform Bill 2005 was enacted to give legal backing to the reforms in the energy sector. By this singular act, the monopoly of NEPA has been broken and a competitive market structure has been ushered in, and private participation free to come in. The relevant questions are: will the passing of the bill into law guarantee more efficient and regular supply of electricity at minimum tariffs? Will the current reform avoid the situation of transferring state monopoly into private monopoly, as competition among few participants is prone to the exercise of market power by the dominant player in the industry? These questions among others have spurred the need to examine the challenges and prospects of power sector reform in Nigeria. Specifically, the focus of this paper is on the market structure, institutional considerations and supply gap in the electricity generation in Nigeria under the reforming scenario. The experience of electricity blackout in early 2000s by some leading countries such as Italy 2003; California (US) 2001; Auckland, (New Zealand) 1998, Chile 1998-1990 made Watts (2001) to admit that,

"*it is clear that deregulation is a high risk choice. Those jurisdictions that have not yet deregulated electricity generation need to think long and hard before they go ahead. Those that have done so need to figure out how to minimize the downside potential of the journey on which they have embarked. (*Newbrey (2002)

In view of this fear even in countries that are regarded as developed made a reconsideration of energy sector reform in country like Nigeria imperative. Perhaps, such reconsideration by looking at the theoretical and institution framework for electricity policy reform will shed light on these issues will be quite fascinating and illuminating for necessary policy options and fine-tuning in Nigeria.

The rest of the paper is organized as follows. Section 2 discuses some theoretical and empirical considerations. Section 3 is on the overview of the electricity sector and the electricity sector reform Act 2005 in Nigeria while section 4 is on the envisaged challenges and prospects of the reform. Section 5 concludes with policy implication and suggestion

Theoretical and Empirical Issues Electrivcity Generation

The central thesis of industrial organization is that the structure of the organization determines the performance, which is normally measured in terms of operational efficiency. However, one possible point in explaining the structure-conduct-performance of an enterprise is the theories of perfect competition and monopoly. The structural features of both markets have been discussed elsewhere (Jehle and Reny 2001); however, they provide a description of the extremes (an infinite number of firms versus one firm and free entry versus blockaded entry) and all industries in practice can be seen as falling somewhere between them. The position of any particular industry can be located along this continuum by looking at the structure of that industry in terms of the number of firms, ease of entry, etc. and from that predict the performance of the industry, particularly in respect of profitability. Thus as we move through the continuum from industries with a large number of firms to industries with only few firms, it is postulated that profitability will rise from normal level towards super-normal level of monopoly. However, the long run economic implications of both competition and monopoly are well documented in the literature.

Penrose (1963) for example has argued that competition is the most powerful force pushing the economy to higher levels of achievement, increasing efficiency in the use of resources, protecting consumers against exploitation and ensuring reasonable opportunities for men to make the most of their abilities and assets. On the other hand, monopoly breeds inefficiency and leads to misallocation of scarce resources. Until recently, electricity industry has been operated as state-own monopoly with the attendant inefficiency in service delivery, innovation and management particularly in the developing countries. However, the trend now is competition in the industry.

Theoretical economic models, such as perfect competition and monopoly models, are too general to be applied directly to the electricity industry since they do not take into account many fundamental aspects of actual electricity markets Recently, developed models combine the technical characteristics of electricity based on operational models and the modeling of firms behaviors based on oligopoly competition theory. The models differ mainly in the set of assumptions and of variables they deal with. We present a survey of the most relevant models in this section focusing on the technical characteristics they take into account, the economic model they use and the purpose they serve.

It is well recognized that, given the concentrated nature of the market structures, oligopoly competition models are the most suitable models for analyzing electricity markets. The choice between Betrand and Cournot competition represents the two major alternatives (Blake, 2003). Depending on the purpose of the model and the type of market, one approach might be more relevant than another. In general, and especially in period of high demand, it appears that the Cournot paradigm corresponds more closely to electricity markets (Borenstein and Bushnell, 1999). The use of Cournot competition is supported by the fact that electricity suppliers have limited capacity. In the Betrand approach, any firm can capture the entire market by pricing below other competitors but, since electricity producers have increasing marginal costs and limited installed capacity, Betrand's assumptions regarding behavior appear less

realistic (Hobbs, 1986). However, in some circumstances, for instance, periods of low demand, it has been argued that Betrand model might be a relevant approach (Green and Newbery, 1992; Wolfram, 1999). Hence, the nature of demand and the level of capacity constraints are fundamental variables that need to be taken into account to choose between Cournot and Betrand competition.

The third model for the analysis of imperfect competition is the supply function equilibrium model (SFE) in which firms compete with each other through the simultaneous choice of supply functions. Klemperer and Meyer (1989) developed SFE in order to model competition in the presence of demand uncertainty. The idea behind their model is that even if an oligopolist knows its competitors' output the presence of demand uncertainty implies that the oligopolist faces many possible demand profiles. Accordingly, management's decisions about size, structure, corporate values, and decision rules of the firm implicitly determine a supply function that identifies the outputs that the firm will sell at prices that the market will accept. Such a supply function provides the firm with flexibility in adapting to changing business conditions.

The SFE model is more intuitively appealing than the Betrand and Cournot models because it allows for a strategy space in which competing firms choose entire supply functions. The strategies of the Betrand and Cournot models are limited because firms choose either prices or quantities. Consistent with the Nash equilibrium solution concept that the three models share, each firm's choice of supply function occurs simultaneously. In general, SFE price equilibra are generally between the Betrand and Cournot extremes.

No doubt, the United States has been one of the foremost countries in the world, which has embraced competition in her electricity sub-sector with remarkable success. However, this observation should be qualified because of the recent developments in California. California originally reformed and liberalized its electricity market because of the dissatisfaction over high consumer prices. Unfortunately, average wholesale prices in 2000 after liberalization were more than three times those of 1999. The year 2001 witnessed several blackouts with consequent adverse effect on companies, many of which folded-up, recording high-rate of bankruptcy in that year. As observed by Joskow (2001), California shows that poor market design coupled with inappropriate regulatory and political intervention, can rapidly produce extremely unsatisfactory outcomes when capacity is tight, particularly if the shortages are unexpected. This observation seems to corroborate with Joskow's (1998) assertion that the success of infrastructure sector reform, in particular, electric power, partly depends on the creation of effective regulatory institutions. He therefore submitted that issues to be addressed in designing the institutions would include, establishing regulatory goals and deciding on the structure and organization of regulatory agency. It must be stressed at this point that the issue of institutional setting is crucial in both developed and developing countries in the light of the recent development in California.

Midttum and Thomas (1996) presented a comparative study of British and Norwegian electricity in introducing competition into their electricity industry. Britain and Norway have been European pioneers to embrace competition in their electricity industries, but they have done so in very different ways. Both countries attempted to create a system in which the potentially competitive activities, generation and supply to final consumers were opened up to competitive market forces. However, Britain has liberalized by privatization leaving generation largely concentrated in a few companies. Norway has maintained a dominant public ownership but has sought to create a competitive environment through a decentralized production structure. The British 'capitalist' and Norwegian 'structuralist' approaches both exhibit clear market oriented features, but with the dynamics placed respectively on the ownership side and on decentralized competition. This study has raised a salient question of ownership and control of public enterprises between the private and public. While Britain favors transfer of ownership from government to private sector, Norway embraces public ownership with competition. The danger of outright transfer of ownership from government to private sector is obvious in the context of developing countries like Nigeria. Provided the emergent ownership structure is carefully designed, privatization may lead to transfer of government monopoly to private monopoly, which will be counter-productive. Economic history has shown that as there are efficient private companies, there are equally efficient public companies and vice-versa. Hence, the issue of ownership is incidental to operational performance. What is crucial therefore is the enabling environment that will generate healthy business competition on a level playing ground for the operators of the enterprises, public or private. This argument, however, has been extensively discussed elsewhere (Isola, 2002).

However, the strengths and weaknesses of the approaches adopted by Britain and Norway would no doubt be informative to developing countries that are in the threshold of liberalizing their electricity sub-sector. It must be noted that the UK experience with restructuring of generation and mitigating possible market power has demonstrated the complexity and challenges involved in introducing competition into the sector. Green and Newbery (1992) show that the initial structure based on only two unequal competing generators was inefficient and that two equal competing firms would be more effective. Wolfram (1999) shows that although prices under oligopoly appear to have been above marginal costs, regulatory constraints, threat of new entry and financial constraints may have produced lower prices than theory would suggest. The experience of the UK

with respect to the determination of the optimum market structure might therefore be relevant to Nigeria at this stage of her restructuring effort.

Over the past few years, the power sector in many Latin American countries has been transformed to make it efficient and competitive, with an increasing level of private ownership and management. An intriguing aspect of electricity sector reform is that the first of such reform was witnessed in Chile in the 1980s, a developing country with a small system, weak rule of law and weak democracy. Generally, these qualifications are regarded as major obstacles to market-oriented reform with private sector participation. However, electricity reform in Chile appears to have faired relatively better than most other developing countries that reformed later despite having the benefit of experience from other countries. The relative success of the Chilean reform experience can provide insight on long-term performance of reform generally.

Galal, Jones, Tandon and Vogelsang (1994), in one of their first and most comprehensive studies of reform, analyse the welfare implications of privatization of state-owned enterprises. The study is among the first to emphasis that privatization of natural monopolies, when combined with proper regulatory framework, can be welfare enhancing. The majority of the cases examined in the study were taken from developing countries, which included the privatized Chilean electricity companies. The study finds that privatization of the two Chilean firms produced significant welfare improvements. Overview of the experiences of other countries were presented by Estache and Pardina (1998) and Hunt (1997). The experiences of all these countries will no doubt be of interest to our study.

Arising from our theoretical and empirical considerations, a number of lessons can be learnt by Nigeria in her restructuring efforts. First, the need to model optimum market structure from the onset. The modeling of the market structure will provide an insight to the behaviour of the operators in the industry. Second, there is need to pay attention to the institutional considerations, that is, the fundamental rules of the game under which the market operates, hence the issue of market design, regulatory framework, and credible regulatory agency devoid of government intervention and manipulation must be firmly put in place. Perhaps the most important lesson is that models that appear to work well in some circumstances and place may not be easily transferred to countries facing different circumstances.

There are already a good number of studies on electricity industry in Nigeria, (see Ayodele, 1978; Taiwo, 1982; Ukpong (1973), Kayode, 1972; Iwayemi, (1975,) Awosipe (2003); Ogunkola, (1992); These studies have either looked at the supply side or demand analysis of electricity industry in Nigeria, but the uniqueness of this study lies in the fact that it examines matters arising from the newly enacted Power Sector Reform Act 2005, which was signed into law on the 11th of March 2005. It attempts to examine the way forward for the sector from its lack luster performance of the years.

Electricity Sector Reform in Nigeria

The Electricity Reform Act 2005 is the latest legislation in the array of legislations on the electricity industry in Nigeria. It would be recalled that the Nigerian electricity industry began towards the end of the 19th century, when the first generating plant was installed in Lagos in 1898 by the colonial government. The Public Works Department (PWD) was in charge of the management. In 1950, the Federal Government passed the Electricity Corporation of Nigeria Ordinance No. 15 of 1950. Several other legislations had been enacted such as the Niger Dam Authority (NDA) Act of Parliament in 1962 and the Degree No 4 of June 7 1972, by which the National Electric Power Authority (NEPA) was established. NEPA was mandated to maintain an efficient, coordinated and economic system of electricity supply to all parts of Nigeria. The law made NEPA the sole body responsible for the generation, transmission, distribution and marketing of electricity. A monopolistic status was thus conferred on NEPA.

NEPA as a state owned establishment remained inefficient in service delivery, innovation and management. Following the implementation of the Structural Adjustment Programme (SAP) in 1986, the Federal Government has put in place several measures to revamp the sub-sector. In 1988, NEPA was commercialized which enabled the organization to review its tariffs upward. As part of restructuring effort, the President of Nigeria recently signed into law the Electric Power Sector Reform Bill 2005 that has broken the monopoly of NEPA. The specific objectives of the reform are stated as follows:

- To ensure a system of generation, transmission, distribution and marketing that is efficient, safe, affordable and cost effective through out the industry. In the long run, to provide access to electricity, although not necessarily through grid;
- To ensure that the electricity supply is made more reliable so as to effectively support the socio-economic development of the country;
- To ensure that the power sector attracts private investors both from within and outside the country;
- To ensure minimum adverse environmental impact; and
- To ensure a leadership role for Nigeria in the development of the proposed West African Power Pool.

In order to actualize the above lofty objectives, the Power Reform Act 2005 has adopted wholesale competition model as opposed to the single- buyer model or retail competition. In this arrangement, distribution companies buy power directly from generators and the

transmission company is a pure electricity transport and dispatch company. Adoption of this model has therefore paved way for the breaking down of NEPA into 18 companies, including 6 generators, 11 distributors and one transmission company. In addition, the Act made provision for the reform in phases. First, a 100 per cent state-owned Initial Holding Company (IHC) is created and vested with the assets and liabilities of NEPA. This company co-exists with Independent Power Producers (IPPs), of which NEPA has signed power purchase agreements. The new National Electricity Regulatory Commission (NERC) is also created in this stage. The creation of this independent regulator is fundamental to the reform programme and the objective of attracting private sector investment. Successor companies are also incorporated in this phase for the purpose of assuming the assets and liabilities of the IHC. These companies will have powers to carry out the functions relating to the generation, transmission, trading, distribution and bulk supply as well as resale of electricity. Cross-ownership is strictly prohibited. The federal government would, initially; hold the shares in the successor companies and these companies would gradually be privatized. A special purpose entity would also be created for the purpose of procuring electricity from successor generation companies as well as the IPPs.

In the second, medium-term, phase, the privatization of the successor generation and distribution companies would have largely been completed, while the successor transmission/dispatch company would be left under the control of the government. This phase is characterized by competition among generators, by energy trading between generators and distributors, primarily on the basis of bilateral contracts.

The final, long-term, phase involves the establishment of a wholly competitive market, characterized by economic pricing of electricity that would allow for recovering full cost of supply electricity.

Issues, Challenges and Prospects of the Reform

It must be noted at this point that the effectiveness of any reform programme depends as much on the details of the reform as it does on the general principles that are followed. Consequently, for the effective realization of the objectives of the Electricity Reform Programme in Nigeria, some issues that bordered on the market structure, ownership, conduct regulation among others must be addressed. This becomes necessary because how each of these aspects of the reform is applied has an equally if not more important impact on the overall effectiveness of the reforms on the growth of the economy. This section therefore, considers some examples of the way in which even well intentioned reforms in each of the key areas can have less than the desired impact on the economy and in some cases can even have a negative impact.

Market Structure

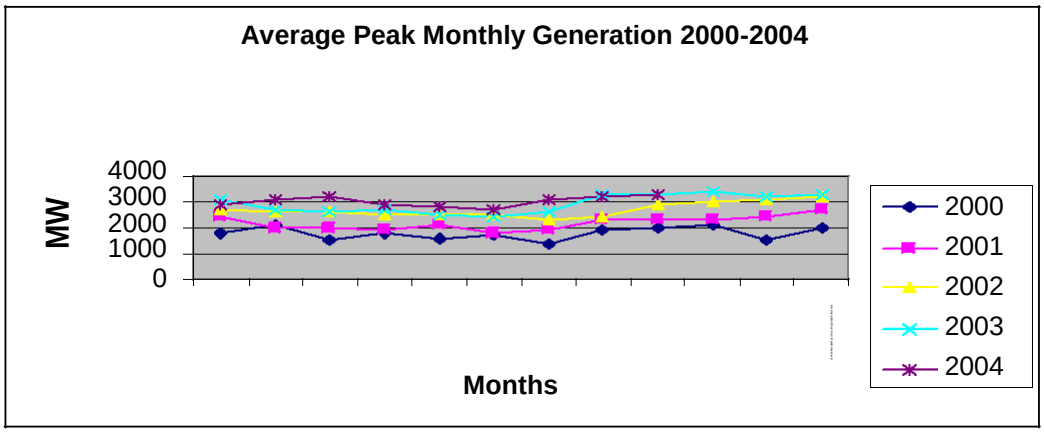
The introduction of competition in the generation of electricity has been a key aspect of electricity industry reform and decentralization. A central feature of decentralized electricity industry market is the wholesale electricity spot market or pool, competitive pools – by this, we mean electricity spot market in which generators compete to supply energy through their supply prices or bids. This is central to the introduction of competition in the electricity industry.

The creation of a pool raises a number of fundamental questions concerning market structure with respect to the exercise or abuse of market power. Apparently, to forestall this problem, NEPA has been broken into 18 companies including 6 generators, 11 distributors and 1 transmission company. In addition, by the Act, the National Council on Privatization has to establish within the next few months, (that is by September 2005), a holding company to take over the assets and liabilities of NEPA. The relevant question is that: is six (6) firms sufficient (as a starting point) to ensure reasonable market structure, for instance, in power generation? More importantly, what should be the criteria for selecting the number of firms required to constitute the appropriate market structure? These questions become more relevant as the design of market structure can either make or mar the success of the reform. The size of the market must neither be too large so as to create the problem of excess capacity nor too small with the attendant abuse of market power. However, it has been found that duopoly is prone to the exercise of market power.

Recent empirical studies provide some evidence that generators have exercised market power in both the California and United Kingdom (UK) (Wolfram, 1999), which is partly attributed to poor market structure design. Perhaps, a study needs to be conducted to ascertain the optimum market structure for the country, taking cognizance of the nature of demand and the cost structure of electricity in Nigeria that can guarantee production efficiency and allocative efficiency.

Regulatory Framework

Furthermore, an equally important set of issues concern the design of the pool bidding process or auction. Should electricity auction be “one-shot” or “iterative”? Should there be a single market-clearing price, or should prices be determined by individual transactions (i.e. as in a dynamic “bid-ask” market)? Should a uniform first–price or discriminatory second–price auction be used? What constraints on generation bidding behaviour should be



Source: National Electric Power Authority, Headquarters, Abuja

imposed? All these questions should be addressed within the regulatory framework of the reform in Nigeria.

The Act, however, has made provisions for the establishment of the National Electricity Regulatory Commission (NERC). The NERC is the regulatory body in charge of creating a level playing field for players that will emerge in the power industry to compete with the companies coming out of NEPA. The effectiveness of the power sector reform will therefore depend on the ability of the regulatory body to discharge its duties efficiently. Consequently, the selection of members of the commission should be based on merit, integrity, commitment, professionalism and academic excellence. In other words, economic and technical considerations should supercede political expedience in the selection of the members of the committee.

Ownership

Ownership of the companies is another crucial issue. When the ownership of an industry is moved out of public hands into private hands, there are many possible factors that need to be considered. One of the primary problems that may arise with the ownership of multiple companies (either vertically or horizontally linked), is that of transfer pricing. Transfer pricing is the situation where one business within a group charges another business within that group for a product it needs as input. This raises concerns for conduct regulation since it provides ample opportunity for a company to pay an abnormally high price for services rendered by sister companies. The cost of which is then passed on to the consumers. The abnormally high price leads to abnormal profits in the competitive business. This is a problem that is best avoided through the establishment of an appropriate industry structure and limitations on common ownership. Although the Act does not accept cross-ownership of companies, but the Nigerian way of sidetracking rules is a concern. The experience during the execution of the Nigerian Indigene-sization Degree where some nationals were used as fronts for the foreigners confirms this position. This has been discussed at length elsewhere – Onimode, (1984). The privatization of the 18 units that is to be created out of NEPA has been vested in the Bureau of Public Enterprises. The BPE must get out of the lethargy it has gotten into with the privatization exercise so far. It should also be more thorough and transparent with the exercise to avoid the case of the past where public enterprises were sold to rent seekers instead of genuine businessmen – (see Isola; 2002, for extensive discussion on this).

Conduct Regulation

Another area that appears to present concerns relates to the details of the conduct regulation that has to be put in place. Conduct regulation entails the needs to address a wide range of issues including the establishment of average tariffs (and possibly the tariff levels) and the quality of service to be provided and penalties that should be applied when quality levels are not met. Many of these issues are associated with whether or not real independence is provided for the regulatory office. When independence is limited, or non-existent then some of these issues assume greater importance. It is at this point that the NERC should be made independent of the government. This is a great challenge for government in Nigeria, because the level of our political maturity is still at lowest ebb.

Furthermore, the political and social acceptability of the reform requires that the poorer elements of society are made no worse off and should actually benefit from the electricity reform. Consequently, the Act has made provision for the establishment of regulatory agency to cater for the interest of the rural dwellers in Nigeria. In discharging its responsibilities, it is necessary for the regulatory agency to take a cue from the Chilean experience particularly the aspect that concerns

community self help, merit based award of subsidies, and working with development agencies and NGOs to develop renewable energy programmes for very remote communities.

In spite of the aforementioned challenges, electricity reform in Nigeria has tremendous potential for accelerating the pace of economic growth in the country. In fact, the success of the National Economic Empowerment Development Strategy (NEEDS) in alleviating poverty in Nigeria partly hinges on regular supply of electricity for industrial consumption. This is because regular supply of energy will no doubt energize the industrial sector and give room for expansion and consequently enhance employment opportunities and poverty reduction.

According to Fehr and Harbond (1998), the effect of deregulating electricity depends on the situation at the time of reform. Where an existing monopoly provider is working well and meeting consumer demands at cost reflecting tariffs, allowing competition will have little or no immediate effect. On the contrary, where there is an inefficient incumbent failing to meet market demand, (as the situation in Nigeria), deregulation offers a number of advantages.

First, substantial supply gap for electricity generation exits in Nigeria. Inspite of the considerable attention given to the energy sector, since the inception of the Obansanjo civilian administration - 1999 to date, supply of electricity has not kept pace with demand. As shown in Figure 1, the generation of electricity has been oscillating within the range of 1,700MW and 3,500MW in a country where the estimated generation (demand) is put at 10,000MW per day (Imoke, 2004). However, by breaking the monopoly of NEPA, genuine entrepreneurs have wider latitude to operate and fill the gap in the industry.

In Nigeria, the World Bank (2002), found that as a result of the unreliability of the monopoly provider (NEPA), virtually all manufacturing firms own some form of generating capacity. The greater majorities of firms use NEPA as the primary source of power but maintain sufficient back up to power their entire operations in the event of power failure. Similarly Adejugbe (2006) and Isola (2005) have equally alluded to the negative impact of epileptic power supply through NEPA on the manufacturing concerns in Nigeria. Even private household consumers rely on generating sets for electricity to enhance their comfort. Reforming electricity in Nigeria in such a form that allows inflow of private investments into the electricity sector that will bring about efficient supply of electricity at reasonable tariffs is a welcome development. This is expected to impact positively on manufacturers of goods and services in the country. The implication is that their cost of production will reduce and consequently, prices of their products, thereby enhancing consumers' welfare.

Although, the power sector may not attract so many players as the communication sector because of its specialized nature, vast investment opportunities exist in the sector since the unbundling of NEPA has been given legal backing. The first area of opportunity will be the 18 companies, which have been created from NEPA, which will provide employment opportunities directly or indirectly. Besides providing employment, the reform will provide opportunities for private concerns that have been itching to play in the power sector. This will open avenue for private investments in the sector.

Already from the distribution and marketing unit of NEPA, 11 companies have been created, while there are 6 generation companies, and one Transmission Company. These companies, which will be autonomous, will provide stable power supply for the geographical area, which they serve. They are also expected to evolve separate deals with power generation companies that will supply them power regularly in other to ensure efficiency in power supply. This will also create massive employment opportunities.

CONCLUSION AND POLICY IMPLICATION

International experience has shown that competition among electricity generation companies is a major goal of restructuring in the electricity industry. It is expected that the more competitive the market for selling power, the lower is the price. Available evidence has shown that introduction of competition in the generation segment of electricity industry has been a success in both developed and developing countries. However, competition on its own does not guarantee success, rather, a blend of competition with credible institutions – the fundamental rule of the game under which the industry operates.

From the international experience, it has been observed that when the rules in terms of market design, regulations and conduct regulatory agencies are strong, deregulation of electricity has been a success, and otherwise, where the institutions are very weak. Consequently, in the light of the international experience, it is crucial for Nigeria to address a number of issues as earlier on raised in this paper. Concerning the market structure, a simulation study needs to be conducted to provide an insight into the optimum structure of the industry. This cannot be achieved by a mere rule of thumb. Isola (2011) appears to have provided an insight into this issue by looking at the market structure in the restructuring of the Nigerian electricity industry.

Another crucial issue is the ownership of the emerging companies after privatisation. Although the Act does not accept cross ownership of companies but the Nigerian way of sidetracking rules is a concern. In this respect, in order to ensure transparency and accountability in the conduct of the exercise, the privatization agency should be strengthened and have the authority to conduct deals and be independent to the government.

Furthermore, the study has established a considerable

supply gap in the electricity generation segment. However, to really motivate genuine investors the investment climate must be made attractive. There is need for a conducive economic, social and political environment in the country since the sector cannot operate in vacuum of its environment. Inputs of electricity production are tradable goods (gas and fuel), which are normally denominated in foreign currency, but the outputs are mostly sold within the country in local currency. The achievement of efficient supply of electricity at affordable tariffs therefore, hinges on a stable exchange rate. The social environment is still characterized by tension and frustration with frequent ethnic and religious crisis across the country. The political climate is still very cloudy. The political situations in Anambra and Plateau states and the constant impeachment threat on the President of the nation are still very fresh in our memories. Recently, the Niger Delta crisis and the Boko Haram menace in the Northern part of the country must be underscored and noted. All these issues, which constitute wrong signals to genuine foreign investors in the power sector, must be tackled accordingly.

In conclusion, electricity reform may be likened to fire, which if unregulated produces havoc; while regulated it gives light and warmth, consequently policy issues as matter of urgency and priority should be directed to the following areas. First, a study needs to be conducted to ascertain the optimum market structure for the country, taking cognizance of the nature of demand and the cost structure of electricity in Nigeria that can guarantee production efficiency, allocative efficiency and dynamic efficiency. In addition, appropriate market design that can ensure sustainable reform must be put in place. Besides, electricity reform is complex and technical, hence, the need to embark on training and retraining of trainers together with public enlightenment. Lastly, the composition of NERC is very crucial to the success of the reform. Consequently, the selection of members of the commission should be based on merit, integrity, commitment, professionalism and academic excellence. In other words, economic and technical considerations should supercede political expedience in the selection of the members of the committee.

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