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Non-Deregulation of the Distribution Segment of the Power Industry in Nigeria and Sustainable Service Delivery by the Ikeja Electricity Distribution Company: Towards A Competitive Electricity Industry in Nigeria

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Abstract: There are 11 companies operating in the country each with an allotted operational zone. The objective of the study was to establish that the non-deregulation of the of the Nigeria electricity power industry significantly affects the ability of the Ikeja Electricity Company to deliver sustained power supply to consumers. The sample size was 377 calculated using Raosoft sample size calculator. Out of the 377 copies of the questionnaire administered, 315 were returned fully completed representing a response rate of 83.55%.The analysis of data was done with Z test. There were 10 findings. The only hypothesis of the study shows that the non-deregulation of the Nigeria electricity power industry significantly affects the ability of the Ikeja Electricity Company to deliver sustained power supply to consumers. The recommendation is that the distribution segment of the market be deregulated to give rise to competition.
Keywords: Non-deregulation, power industry, sustainable service delivery, competition.

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1.0 Introduction

Away from the 'natural monopoly' argument in the electric power industry, management literature, including some extant studies on the electric power industry, reveal that although monopoly looms large in the industry it is a "regulated monopoly"; especially at the distribution segment. This means that there is some form of government regulation in order for it to have some control over the industry. However, some studies have also shown that regulated monopoly in the industry neither results in lowering of electricity rates nor does it lead to substantial increase in productive efficiency which should benefit the customers (Candell and Ellig, 1997). Rather, it only leads to increase in profits which favour mainly the investors (Jarrell, 1978).

For instance, a study done with data drawn from 1962, during the "golden age" of regulation, when it seemed that regulation was doing well, shows that regulation marginally reduced electricity prices by not more than 5%, and even less (Moore, 1970). Some other scholars argue that although electricity rates were reduced after regulation in the late 1970s and early 1980s, these reductions in rates were not attributable to increased productive efficiency. On the contrary, the regulation succeeded in redistributing wealth from the shareholders to tax payers but did not improve productive efficiency (Wenders, 1986). On the other hand, deregulation is the removal or repeal of government regulations in the economy arising from inefficiencies in government regulations, with a view to removing the risk of the regulated industry controlling the regulatory authorities to its benefit and to the hurt of the consumers (Wikipedia, 2017). Following from this, non-deregulation therefore means the absence of deregulation; a situation where government does not regulate a system which could either be a monopoly, a duopoly or an oligopoly.

The power sector in Nigeria has been privatized since 2005. Prior to privatization, the power sector was controlled by the Power Holding Company of Nigeria (PHCN), a parastatal wholly owned by government, but in this era of a privatized power sector, the monopoly has shifted away from government to the 11 companies owned by the private investors that took over the 18 publicly-owned companies that hitherto controlled the sector. With the privatization, the sector is now made up of the electricity generation companies (Gencos), the transmission Company of Nigeria (TCN), and the electricity generation companies (Discos). What this translates to therefore is that the privatization of the power sector in Nigeria has witnessed a transition from a monopoly to another monopoly. The Power Holding Company of Nigeria (PHCN), was the monopoly government enterprise that was solely responsible for the generation, transmission, and distribution of electricity in Nigeria; and with the privatization, the 11 distribution companies have been allotted specific operational domains without providing room for other competing companies in those areas allotted to them as shown in the areas covered by them in Table 1.

Consumers, household and industrial, were hopeful that with privatization, the "dark days" would be over; especially as it was obvious that some foreign investors who were carrying so much operating cost in individual power generation had exited the Nigerian market even to neighbouring countries like Ghana with more steady power supply. This was not to be so; electricity supply has not improved appreciably post-privatization from what it was as a government monopoly; when it was solely the responsibility of government to generate, transmit, and distribute electricity. The current situation is that while the demand side made up of customers and consumers is desirous to reap sustained dividends from a privatized power sector, the supply side which is in the hands of monopoly companies that emerged out of the privatization is unable to meet up with the demand for electricity.

Table 1. The Electricity Distribution Companies and Operational Domains

	Name of Company	Domains Covered by Discos
1	Abuja Disco	Federal Capital Territory, Niger, Nassarawa, Kogi
2	Benin Disco	Edo, Delta, Ekiti, Ondo
3	Enugu Disco	Enugu, Ebonyi, Abia, Imo, Anambra
4	Eko Disco	Lagos State (Victoria Island, Lekki, Lagos Island, Apapa, Epe, Ikoyi, etc)
5	Port Harcourt Disco	Rivers, Bayelsa, Cross Rivers, Akwa Ibom

6	Ibadan Disco	Oyo, Ogun, Osun, Kwara
7	Ikeja Disco	Lagos State (Ikeja, Surulere, Ikorodu)
8	Jos Disco	Bauchi, Benue, Gombe
9	Kano Disco	Jigawa, Kano, Katsina
10	Kaduna Disco	Kaduna, Sokoto, Kebbi, Zamfara
11	Yola Disco	Adamawa, Borno, Taraba, Yobe

Source: The Nigerian Electricity Regulatory Commission, 2005

Consequent upon the foregoing, the privatization of the electric power industry in Nigeria is one without the deregulation of the industry that would have ushered in competition; that is, it is an environment of a regulated natural monopoly. Two key issues are therefore involved in this study: (1) the non-deregulated market under which the electricity distribution companies that arose out of the privatization of PHCN operate and (2) their capability to provide sustained service delivery under the prevailing business environment. Simply put, a service is what a customer receives from a seller or producer in return for his or her money; while service delivery is the process of rendering a service to customers, consumers or clients. In service delivery, two critical factors are considered: the process of the service delivery and the service outcome. For there to be customer satisfaction, the service must be perceived by the customers, consumers or clients to be of good quality, and this in turn, leads to customer loyalty and retention. The quality of service delivery is measured by the extent to which the service is able to meet the customers' expectations (Mohr and Bitner, 1995; Ndingo'ori, 2015).

Unlike the shareholder view of firms as being primarily established to make profits for the shareholders to the exclusion of other stakeholders, the emphasis is now on the longevity or sustainability of the activities of a firm and its relevance in solving global problems. In the case of service industries, the focus is on how their activities affect the stakeholders in terms of quality of service delivery for their services to be considered valuable, reliable, and sustainable to the stakeholders. In other words, there has been a paradigm shift to an inclusive approach to the achievement of social and environmental goals in addition to the classical profit motive of firms because of the current global social and environmental dynamics, some of which are threatening human existence.

Of the extant definitions of corporate sustainability, the one by the United Nations Global Compact (2014) presents the greatest appeal. It defines it simply as "a company's delivery of long-term value in financial, environmental, social and ethical terms". With the emphasis on "delivery of long-term value" to customers by companies, it has become highly imperative that companies that are committed to long-term corporate success and that understand that such success is possible through their ability to deliver value to their customers should today embrace corporate sustainability. The three pillars of sustainability are social ('people'), environment ('planet'), and economic ('profit').

The people (employees and customers) are the social. The employees are the history makers who desire job security and pride in the workplace and the customers desire transparency more than ever before from the companies they do business with in terms of how responsible, ethical, and sustainable they are; the environment (the planet) is in terms of recycling a company's waste products and handling of issues of environmental degradation and pollution; while the economic (profit) is in terms of the money the companies make from their business activities (Investopedia, 2017; Wikipedia, 2017). Sustained service delivery falls within the framework of corporate sustainability.

From the definition on sustainability, sustained service delivery can be inferred to be about how a firm is able to deliver its services to its customers on a long-term basis in such a way that it is not concentrating on profits alone; but on how their services are delivered to the customers, how the customer base can be sustained through providing services that are perceived to be of good quality as perceived by the people being served, to encourage their customer loyalty as shown in their repeat patronage and their willingness to invite others to purchase the good or service. Firms with sustainable products or services, from the point of view of the United Nations Global Compact (2014), adhere to five business principles: (1) they should have a principled business by operating with integrity which compels them to have respect for fundamental issues like human rights, labour, environment and anti-corruption; (2) be strengthening society, which makes them take on issues outside their internal operations to include strategic issues prevailing in its external environment such as poverty, conflict, uneducated workforce, etc., that would contribute to their business success and viability; (3) have leadership commitment, which involves bringing about change in the companies starting with their leadership; (4) be reporting progress, which emphasizes that in addition to the strategic reports which show measurable gains and losses, attention is also paid to non-financial reporting; (5) and have local action, through which companies, realising that there are general universal principles of managing, should also not lose sight of the fact that they exist in nations and communities and must act within them as responsible corporate citizens.

1.1 Problem Statement

Recently, there was an attempt by the regulatory body, the Nigerian Electricity Regulatory Commission (NERC), to introduce some measures that would usher in the deregulation of the market in the power sector in Nigeria in order to eliminate the regulated monopoly business environment inherited from the PHCN. Pursuant to the deregulation, the Nigerian Electricity Regulatory Commission (NERC) made a declaration on the "eligible customer regulation" to the effect that eligible customers could purchase electricity directly from the electricity generating companies (Gencos) to eliminate the storage of unused excess generated power to the tune of about 5000megawatts.

The purchase was to be done without necessarily going through the distribution companies. However, the electricity distributing companies (Discos) are vehement in their opposition to that proposal as they argue that it was not provided for in the performance agreement signed with the government at the time PHCN was unbundled. Also, the Discos, relying on the position that the introduction of such deregulatory actions is rather premature; as the market is not yet ripe for competition, have been prompted into a declaration of *force majeure*: a declaration of the existence of unanticipated circumstances that could be pledged for inability to perform by a party to a contract.

However, the position of the Gencos to the Discos' stance on the deregulation of the buying and selling of electricity activities is that the rejection of the "eligible customer regulation" could have a negative impact on the privatization of the industry because the load rejection by the Discos is likely to create a major hurdle in the operations of the Gencos; and could further threaten the survival of the privatized power sector. The Gencos further argue that although the Electric Power Sector Reforms (EPSR) Act did not provide explicitly for a competitive market, the eligible customer regulation is meant to be the first initiative towards the creation of a competitive market in the power sector. They complain of stranded generation capacity and poor market liquidity and that the supply to eligible customers is expected to result in increased power generation capacity by the Gencos.

The Gencos are also of the opinion that competition is necessary to be able to address issues that concern the financial viability of the electricity supply chain which, according to them, constitutes the major bottleneck preventing consumers from enjoying constant supply of electricity. We realize that competition in the electric industry has experienced some reasonable degree of success in other countries, such as the United States of America. In Nigeria, there is an overt gap between the levels of anticipated power supply by the Discos in the regulated industry; and their current level of service delivery to the enthusiastic but disappointed consumers. Having noted that electricity supply in the areas covered by the Ikeja Electricity Company has not improved since the Disco took over, and that there is a gap between the consumers' expectations following the privatization of the industry and the actual service delivery to them by the electric company, there is need to establish the role of the non-deregulation of the distribution segment of the market to that gap.

This study is therefore out to investigate the extent to which the non-deregulation of the distribution market contributes to the poor service delivery. That is, the focus is to establish whether the non-deregulation of the market affects the ability of the distribution segment to provide sustained electric power supply to the consumers. Will the level of distribution to the consumers improve significantly under a deregulated and competitive market? We need to explore this research gap by ascertaining whether the services of Ikeja Electricity Company would have been better if the distribution segment of the industry had been deregulated since this would have paved way for competition; and whether the competition would have compelled such competing companies to pursue value creation for consumers, and to gain competitive advantage over their rivals, through managerial commitment to the generic building blocks of competitive advantage; namely, superior efficiency, superior quality, superior innovation, and customer responsiveness.

1.2 Research Objective

The objective of this study is to determine the effect of the non-deregulation of the distribution segment of the power sector market in Nigeria on the sustained service delivery to consumers by the Ikeja Electricity Distribution Company.

1.3 Research Hypothesis

The non-deregulation of the distribution segment of the power sector market in Nigeria has a significant effect on sustained service delivery to consumers by the Ikeja Electricity Distribution Company.

2.0 Review of Related Literature

2.1 The Concept of Deregulation

Deregulation is the removal or repeal of government regulations in the economy arising from inefficiencies in government regulations, with a view to removing the risk of the regulated industry controlling the regulatory authorities to its benefit and to the hurt of the consumers. It has the goal of creating a competitive environment for the players in an industry so as to allow consumers have new choices and new economic benefits (Wikipedia, 2017). Non-deregulation therefore presupposes that there is no deregulation; which means that there is no repeal of government regulations on the companies; whether they operate as monopolies, duopolies, or oligopolies.

2.1.1 Deregulation in the Electricity Power Industry

With specific reference to the electric power industry, deregulation refers to a restructuring of the rules and economic incentives that government puts up to control the electric power

industry. It involves the "unbundling" of the "one giant" vertically integrated utility (where one utility controls multiple segments of generation and distribution) in such a way that the different tasks of power generation and transmission are separated and performed in an environment which allows for competition by different companies. It could also take the form of allowing the entry of small monopolies to create competition (Abhyanker and Khaparde, 2002).

Companies in the UK, Sweden, Finland, Norway, U.S, and some countries in South America were in the 1900s forced to transform their business operational strategy from the vertically integrated systems to the open market systems. The reasons for this paradigm shift are different as we move across developing countries and as we move through the developed countries. In the developing countries, the issues border on high demand growth, management inefficiency, and unstable tariff structures. As a result, it has increasingly become difficult for the companies involved in the power sector to raise funds for investments that should lead to improvements in their critical areas of generation, transmission, and distribution capacities. This has left the companies with no choice than to adhere to the restructuring programmes forced on them by the international funds providers (Abhyankar and Khaparde, 2002).

On the other hand, in the developed countries, the challenge has been that of providing electricity at lower prices and offering the consumers a greater choice on the purchase of energy (Abhyanker and Khaparde, 2002). In the United States of America (USA) in particular, the deregulation of the electric power industry was propelled by the experience of deregulation in five other industries that operate as networks by reason that their suppliers and customers were connected through pipes, wires, air routes, roads, and rails; and where the decisions in one could affect other people's ability to use the network. The five industries were the railroads, the natural gas, the telecommunications, the airlines, and trucking (Crandell and Ellig, 1997).

Like other sectors, the goal of deregulation in the electric power industry is to create a competitive environment that allows consumers to make choices and have new economic benefits. As Abhyankar and Khaparde (2002) would observe, under deregulation, the former vertically integrated utility, which performed all the functions involved in power, including generation, transmission, distribution, and retail sales, is broken down into separate firms with each charged with the responsibility of carrying out each function. This arrangement leaves the consumer with electricity bills from two sources, one from the distribution and transmission operator responsible for the network and services, and the other from the firm that generates the power. In the Nigerian situation, although the generation, transmission, and distribution functions in the electric power industry have been separated following the unbundling of the PHCN, the current position is that the consumers still receive monthly bills from the distribution companies only, because only the generation segment is competitive; while the distribution segment is not.

The argument in the literature has been on whose interest, the investor or the customer, is the regulated or deregulated electric power industry out to protect. A notable scenario is where the market is a regulated monopoly. Scholarly works have shown that electricity consumers are usually not protected by monopoly regulation; and that regulated monopoly does not lead substantially to increase in productive efficiency (Crandell and Ellig, 1997). For instance, the study done by Stigler and Friedland (1962), found that as far back as 1912-1937, when regulation of electric utilities was not common, regulation of the industry had no effect on

electric rates. They argue that although utilities in States in the United States that were regulated recorded lower electric rates after regulation, lower rates were already in existence prior to regulation. In other words, regulation was not responsible for the lower rates; it only led to increase in profits (Jarrell, 1978). The finding by Stigler and Friedland (1997) finds support in another study done by Moore (1970), in which data analysed from 1962, during the "golden age" of the regulation of the industry, that is, when regulation seemed to have done well, shows that regulation reduced electricity prices by not more than 5% and even less.

Another group of scholars argue that although electricity rates were reduced during the late 1970s and early 1980s (Wenders, 1968), these reductions in rates were not as a result of increased productive efficiency. Rather, the reduction in rates is attributable to the fact that regulation succeeded in redistributing wealth from the shareholders to tax payers but did not improve efficiency (Crandell and Ellig, 1997). The regulated monopoly in the Nigerian electricity power industry has not in any way reduced rates for the consumers as they are still subjected to the estimated and coded billing system; while many a consumer still experiences epileptic power supply as they existed in the era of the privatized PHCN.

Still on revenue, it is pertinent to put the continuation of the fraudulent estimated and coded billing system still prevalent in the Nigerian power industry which was inherited from the privatized PHCN in proper focus. Arguments in the literature show that customers pay higher rates in a regulated electric power environment due to some obvious anomalous assumptions in the billing system. The following inefficiencies associated with regulation have been identified as being responsible for keeping rates higher than what they should be in a regulated power market environment:
(1) Distorted input choices which pertains to where electric utilities are granted cost-of-service regulation, whereby regulators estimate costs by looking at the firm's costs for one or more previous years as a guide. With that, they go ahead to approve a price schedule which they hopefully believe would enable the firm to cover its costs and still have a "fair" rate of return. The problem with such regulators is that they create room for the firm to inflate its costs where the approved rate of return is different from the rate the firm actually would require to earn to be able to attract capital. Where the rate is higher than the cost of capital, the firm is encouraged to invest in more capital; but where the rate is lower, the firm would avoid further investment in capital. In fact, some empirical studies on the effect of such distortions show that in the 1960s electric firms were attracted to using more than the cost-minimising amounts of capital (Spann, 1974; Petersen, 1975; Hayashi and Trapani, 1976);(2) Political Influence Costs which shows that the regulatory process has its own costs. The public is compelled to bear additional costs such as utility expenditures to lobby regulators and legislators apart from the usual budgets for the regulatory commissions (Crandell and Ellig, 1997); (3) Lack of entrepreneurial incentives which point to the fact that public utility regulators discourage competition and lower profits. As a result, there are not entrepreneurial incentives to reduce costs, improve on quality, and generate creative and innovative ideas for new products and services. Primeaux (1977) and Stevensen (1982) are agreed that in the absence of competition, generating costs of electricity utilities are increased from between 6%-10%. On the other hand, a comparative study on monopoly and duopoly electricity markets shows that competition reduces transmission and distribution costs from between 2% and 4% (Nelson and Primeaux, 1988).

In the Nigerian question, the implementation of the Multi-Year Tariff Order (MYTO) as provided for in Section 76 of the Electric Power Sector Reform Act 2005 has not commenced

since 2008 when it was expected to take effect. The multi-year tariff order is a methodology for a 15-year tariff path for the electricity industry which allows for major reviews in tariff rates five-yearly and minor reviews yearly depending on a number of parameters such as inflation and gas prices (Electric Power Sector Reforms Act, 2005). Although the Discos have been pressing for increases in tariffs arising from inflation and increase in prices of gas, the government and the regulatory agency, the NERC, have failed to accede to this request because they accuse the investors of failing to inject funds into their operations to ensure efficient and effective supply of electricity to consumers. The electricity distribution companies are also being accused of defiantly failing to provide meters for the consumers as *condition precedent* to increase in the tariff structure in keeping with the performance agreements signed by the both parties at the time of the unbundling of PHCN leading to the takeover of the operations hitherto carried out by the Parastatal. The failure to supply meters is obviously arising from the fact that the Discos are comfortable with the estimated and coded billing system they inherited from the PHCN. The Ikeja Electricity Company regards the estimated billing to be for consumers that have no meters; while the coded billing is for consumers whose meters are said to be non-functional.

No matter how one looks at it, the position of the NERC and government is supported by Section 32(d) of the Electric Power Sector Reform Act 2005, which provides that the NERC shall ensure that the prices charged by the operators are fair to customer and sufficient to allow the operators to finance their businesses in such a way that they will be able to have reasonable earnings for efficient operation (Electric Power Sector Reforms Act, 2005). As a neutral body, NERC cannot be interested in increasing the earnings of the distribution companies whose operations in terms of service delivery and estimated electric rates are not fair to the customers.

Initially in the US, for instance, it was necessary to regulate the electricity power industry because substantial capital was required to build infrastructure as a result of which government was unwilling to invest large amounts of public funds in a new technology. Hence it was agreed that while investors would risk their money to invest in the industry, government should create an enabling environment for them to make reasonable returns on their investments through regulated rates. The implication of this was the conferment of local monopoly on the companies which enabled them to have a good market share since it did not allow for price undercutting by competitions. It also gave rise to stability in the market, which provided the businessmen and government some level of risk minimization in the industry. Other reasons include the fact that through regulation, the electric utility business was legitimized; and electric utilities enjoyed government recognition and support. As a result, the structure of the regulated electric power industry was such that it had large utilities which were the only service providers which were vertically integrated in the sense that the utilities were involved in the generation, transmission, and distribution within their operational domains (Abhyankar and Khaparde, 2002). In Nigeria, apart from the separation of electricity generating companies from the transmission company and the distribution companies, the distribution companies are allowed to operate as monopolies with regulation in their operational domains since there are no competing companies even after the industry has been privatized.

2.1.2 Structure of the Regulated Power System

In effect, the structure of a regulated power system is such that it is operated by an Independent System Operator (ISO) whose responsibility it is to keep the system in equilibrium in such a way that production and imports are continuously matched with

consumption and exports. There are different power sellers that deliver their product to their customers through the retailers, with a common set of transmission and distribution networks which are operated by the ISO. The customer does his transaction either through a retailer or transacts directly with a generating company. If through retailers, the customer communicates with the retailers, in their demand for energy; the retailer communicates such demands to the generating companies, which, in turn, purchases the power for transfer to the customer through the regulated transmission and distribution networks. Interestingly, the customer could also approach the generating companies directly for purchase and supply of electricity which is at variance with what currently obtains in Nigeria. The position in Nigeria is that the distribution companies are vehemently opposed to and have tried to erect barriers through invoking some clauses in the performance agreements signed with government at point of takeover to prevent consumers from dealing directly with the power generating companies for purchase of electricity (Abhyanker and Khaparde, 2002).

In the literature, the key players in the typical electric power industry therefore include the independent System operator (ISO); the generation companies (Gencos); the transmission companies (transcos); the distribution companies (Discos); the retail energy service companies (Rescos); and the customers, which form the supply chain. The ISO is expected to be an independent body that is not a participant in the competitive market; but has the responsibility for monitoring the different entities in the chain. In Nigeria, the ISO is the NERC. The picture of the regulated electricity market therefore is that the Gencos experience competition; the transcos and discos enjoy monopoly; while the Rescos enjoy competition (Abhyanker and Khaparde, 2002). Relating this to the situation in Nigeria, currently there are electricity generating companies (Gencos), there is one transmission company (TCN), there are electricity distributing companies (Discos) which operate as monopolies in allotted operational zones/, but there are no retail energy service companies (Rescos).

The electric power industry in Nigeria is therefore structured with the NERC as the regulatory body, the Gencos, and the Discos, exist in the power market, and are open to competition and regulation respectively; but the Rescos do not exist. The structure currently on ground also shows Business Districts and sub-distribution centres that are owned and controlled by the Discos. However, instead of Rescos, there are small scale private revenue collectors appointed by but are not in competition with the Discos; their responsibility is to collect revenue on behalf of the Discos because they do not have their distribution machineries; they are, in turn, paid commission by the Discos. For instance, in Ikeja Electricity Distribution Company, there are subdivisions such as the Alimosho Business District and the Gowon Estate sub-distribution station; and there are appointed private individuals and companies as well as some designated banks operating alongside the Disco as revenue collectors. Unlike the typical Rescos, the small revenue collectors are not in any form of competition with the Ikeja Electricity Company.

2.1.3 Comparison of Regulated Monopoly and Unregulated Competition

In their comparison of regulated monopoly and unregulated competition, Armstrong and Sappington (2006) observe that in an economic conjecture where the regulator was “omniscient, benevolent, and able to fulfil any promise he makes”, competition “cannot improve upon regulated monopoly” because that would be a “paradise” of some sort. In such a situation, the regulator would make sure that the ideal range of services brought to the market by the producer are produced at the lowest possible cost; but considering that such a paradise is utopian, they also argue that in practice the regulators lack adequate information about the markets they oversee; and are therefore unable to direct and control the activities of

the monopoly producer perfectly. Rather, it is the regulated firm, by virtue of its closeness to the consumers that is better informed than the regulator about the pattern of demand for the regulated services it provides, the minimum possible current cost of delivering the services, as well as the potential of providing it at a lower cost in the future.

From that standpoint, four potential advantages of regulated monopoly over unregulated competition were identified by them: (1) It is easy to control industry prices directly (2) It is easy to make transfer payments to the firm to ensure that desired incentives are provided (3) Imposition of taxes on the firm's profit to generate income for government is easier and this helps to reduce the losses usually associated with other sources of public funds; and (4) It is easy to avoid the duplicating of fixed costs of production as there is only one industry supplier (Armstrong and Sappington, 2006).

On the other hand, they also observe that unregulated competition has the following three potential advantages over regulated monopoly: (1) The possibility that the industry producer could have the low marginal cost is higher under unregulated competition than monopoly because a rival company may secure the low cost even if one firm fails to have it (2) The information advantage of the industry producer is reduced because of the presence of a competitor that has correlated costs (3) It creates a situation where direct operational costs associated with regulation such as salaries of regulators and their staff are eliminated. The first of these potential advantages of unregulated duopoly is what they referred to as the "sampling benefit of competition". They referred to the second potential advantage as the "rent-reducing benefit of competition" (Armstrong and Sappington, 2006).

Using mathematical modelling, Armstrong and Sappington (2006) came up with four conclusions about regulated monopoly and unregulated competition: (1) That it is easier to obtain full information about the market in an unregulated competition than under a monopoly; (2) When demand is perfectly inelastic, the probability of obtaining a low-cost supplier is higher under unregulated competition than in a monopoly because of the sampling benefit that goes with competition; (3) When demand is very elastic, prices that do not track costs closely entail substantial losses in surplus. Prices track costs more closely under regulated monopoly than under an unregulated competition; and (4) Unregulated competition outperforms regulated monopoly when the difference between the high and the low marginal cost is sufficiently close to zero.

On the whole, they further argue that generally where fixed costs of operation are sufficiently large, regulated monopoly will perform better than the unregulated competition. This is because monopoly avoids the duplication of fixed costs. However, this argument is a corollary of the more general observation that supply, under a regulated monopoly, will minimize industry costs if prevailing economies of scale are considered relative to industry demand. They are of the opinion that economies of scale often are pronounced in network industries, where substantial physical infrastructure such as a gas, water, electricity distribution system or a telecommunications network must be put in place in order to deliver service to customers.

Secondly, when the social cost of funds is considered, regulated monopoly offers an additional advantage over unregulated competition. This is because it is possible to impose tax on the rent of the regulated monopolist to fund desirable social projects, thereby reducing the need to turn to other more costly sources to raise revenue (Armstrong and Sappington, 2006).

2.1.4 Creating Competitive Market Mechanisms in the Power Industry

As was the case in the US, after the unbundling of the vertically integrated company, the next stage should be to create competition in power generation activities through deregulation. In the transmission, there is tendency for monopoly because of significant economies of scale; but to avoid overcharging for services, arising from monopoly, there is need for some form of regulation in the transmission segment. This includes introduction of new legal and regulatory framework which gives third parties access to the transmission domain (Abhyanker and Khaparde, 2002).

Deregulation of the industry became the option in the US in the 1980s as a result of changes in economies of scales regarding generation of electricity. The power utilities were able to use large generators to produce power at less than half the cost per kilowatts of what the small generators were able to produce. The shift in economies of scales was driven by technological innovation which led to greater efficiency; improvements in materials such as new high temperature metals, special lubricants, ceramics, carbon fibre, etc.; the computerized control systems which led to staff reduction; as well as data communication and off-site monitoring systems for effective control (Abhyankar and Khaparde, 2002).

For a deregulated power industry to function properly, two entities must be created to give room for the wholesale power market place apart from the ISO, the generating companies (Gencos), the transmission companies (transcos), the distribution companies (Discos), and the retail energy service companies (Rescos). These are: (1) System Operation which enables the transmission system to deliver power from sellers' site to the buyers' locations but must be highly controlled under a real-time basis (Abhyankar and Khaparde, 2002); and (2) the Power Market which allows for power producers to sell their power, and for buyers to purchase the power.

The system operation, when created, gives rise to a competitive market mechanism which allows the electricity sellers to offer their products and sell to buyers. This could be in three ways: (1) Poolco which is the agency when there is only one buyer. The Poolco is either a government or quasi-government agency which buys power from sellers to sell to bidders; (2) Bilateral Exchange which exists where there are multi-sellers and multi-buyers that exchange power at prices and conditions agreed upon by both parties; and (3) Power Exchange (PX) which operates like the Stock Exchange which is faceless. Here the buyers and sellers talk to the marketplace and not the individual buyers and sellers (Ahbyankar and Khaparde, 2002).

The two generally known market models in the electric power industry are: (1) The Pool Model and (2) The Open Access Model. The Pool Model is the model common in the United Kingdom. In the UK, for instance, the Poolco, as the UK monopsony, buys all the energy generated by the Gencos as a single buyer. The Poolco invites bids for energy and decides the price for a particular period in the future market. On the other hand, in the Open Access model, energy auction and future markets are carried out by an independent body known as the Power Exchange (PX), and the system is operated by another independent body known as the Independent System Operator (ISO) whose responsibility is to ensure that buyers and sellers are given equal opportunities to buy and sell through open access to the grid. The buyers and sellers could go through bilateral transactions or be part of the energy auction by the Power Exchange. The Open Access Model is common in California in the United States; while Australia, New Zealand, and the European Union employ either the Pool Model or the Open Access model, with minor adjustments to meet their peculiar demands (PX) (Abhyankar and Khaparde, 2002).

In the study done by Crandell and Ellig (1997), to determine what prospects there are for deregulation in the electricity power industry, they examined the results of five industries that went through deregulation; namely, Gas, telecommunications, the airlines, trucking and railroads. In the area of value of consumer benefits, the telecommunications, the airlines, the trucking and the railroads recorded annual value of consumer benefits of $5 billion, $19.4 billion, $19.66 billion, and $9.10 billion respectively due to deregulation over a period of 10 years. Also, the Gas, telecommunications, airlines, and the railroads recorded real price reduction of 10-38%, 5-16%, 13%, and 4% respectively after 2 years of introduction of deregulation. The same industries recorded 23-45%, 23-41%, 12%, 3-17%, and 20% after 5 years of deregulation; while the Gas, telecommunications, airlines, trucking, and railroads recorded 27-57%, 40-47%, 29%, 28-58%, and 44% respectively after 10 years of deregulation.

As a result of the above impressive figures, Crandell and Ellig (1997) argue that deregulation in the electric power industry is desirable for the following reasons: (1) It leads to substantial reductions in the prices paid by the customers; (2) When matched with customer choices, deregulation gives rise to a match between service quality and customer desires; (3) Customers experience genuine benefits, not just reallocation of costs among different classes of customers (4) The lower the barriers to customer choice, the greater benefits customers get; and (5) Competitive markets continue to evolve in response to consumer needs.

Furthermore, in the study done by Abhyankar and Khaparde (2002), the reasons adduced for the deregulation of the power industry in the US includes: (1) The initial need for regulation was no longer there. This is because it was no longer necessary to provide risk-free finance to build infrastructure. Besides, electricity became a commodity like any other which could be bought and sold in a competitive market; (2) With the privatization experience in other industries, government was persuaded that it was also possible to privatize the power industry. Although deregulation may not necessarily form part of privatization, it comes in to help privatization by freeing the rules; (3) It makes the cost to drop. This is because competition generates innovation, efficiency, and leads to lower costs; (4) It improves customer focus. Monopoly utility companies have the obligation to serve all customers in their operational domains, which include the poor customers; but this does not compel them to be proactive in meeting the needs of their customers. They listen to and respond to customers' needs only when the customers go the extra mile of explaining their needs. On the contrary, the competitive market created by deregulation compels the utility companies to be proactive by anticipating customers' needs and responding to them even before they occur; and (5) Deregulation encourages innovation. While regulation and lack of competition give no incentives to the public utilities to generate creative ideas that give rise to innovations or to take on more risks that increase customer value, deregulation encourages innovation for better service delivery, lower costs, and profit maximization.

2.1.5 Contemporary Global Developments on Deregulation in the Electricity Industry

There are a number of recent empirical studies on deregulated electricity industries in some parts of the globe. *For instance, the United States Environmental Protection Agency (2017) reports that electricity markets in most parts of America have already been opened up for competition; which has provided the platform for the electricity consumers to choose the type of competitive retail suppliers that best satisfy their needs. In particular, the Agency confirms that the competitive retail market provides consumers' the opportunity to choose among competitive retail prices of independent producers in 24 states in America such as California, Texas, and most of the states in the North east. In addition, the Agency also confirms that 18*

of these states and Washington DC have provided avenues for consumers, residential and industrial, to have choices with regard to electricity retail service providers for electricity generation options and other sources of power including renewable energy.

Furthermore, it has become easier for customers in a competitive electricity market to search for various electricity service providers which offer optional "competitive" products or "green" marketing products to customers in competitive or deregulated markets to get bundled renewable electricity from their default supplier or some other competitive electricity suppliers who render alternative supplies. To a large extent, the ability of an electricity consumer to engage in a power purchase agreement (PPA) depends on the market structure. For instance, in the case of physical or direct PPA, the electricity consumer is expected to be in a competitive retail market; and the project is expected to be in a competitive wholesale market that is interconnected with the consumer's ISO. However, to have financial PPA, the electricity consumer, who could be anywhere in the US, could engage in this through a project that is in a competitive wholesale market *(United States Environmental Protection Agency, 2017)*.

On the factors that led to the energy crisis in California under regulation, Sweeny (2002) argues that it is not proper to use the energy crisis that took place in California when the industry was still being regulated to condemn deregulation in the electricity industry. He is able to show graphically the supply and demand equilibrium under California's retail price control regime. He explains that because the Californian consumers did not receive price signals, the demand for electricity did not take into consideration the wholesale prices. As a result, when wholesale prices increased, retail prices did not; and this led to a situation where the consumers were not compelled to reduce their consumption of electricity. The wholesale prices had to increase phenomenally therefore to balance supply and demand; and it was this large price increase that resulted in the energy crisis. However, the situation was different when price controls were removed and deregulation of the electricity market was introduced. This presented a more sensible supply-demand system with no price controls; and signals were properly communicated between buyers and sellers. As a result, increases in wholesale price also led to retail price increases, and this, in turn, encouraged reductions in electricity demand. The net result was that wholesale price increases were limited.

What this translates to is that the electricity crisis in California was not that of electricity deregulation; it was mainly as a result of price regulation at the retail level and rigid regulation which disallowed long-term contracts at the wholesale level. Thus, the crisis emanated from gross mismanagement by the California governor and the California Public Utilities Commission (CPUC). Consequently, as at June 2001, when the seven-month California electricity crisis was over, wholesale prices had fallen to less than $50/MWh, demand for electricity had dropped, new generating plants were being introduced, and more new plants were ready to take off. With a drastic reduction in electricity use, some of which can be traced to price increases at the retail level, and some to demand side management or other energy conservation programmes, new generating plants commenced in California, when the crisis was over (Sweeny, 2002).

In Texas, ChooseTexasPower (2018) reports that the electricity consumers have the power to switch electricity service providers because they know their rights as consumers. The electricity market is deregulated to the extent that consumers are not restricted to meeting their electricity supply from the utility alone and paying the rates dictated by the utility. Rather, the retail electricity providers purchase energy from the generators at wholesale

prices; and the retail service providers compete with each other as they offer consumers options in terms of their various electricity plans. The various electricity retail plans provided by the retail service providers enable the electricity consumer in the deregulated electricity market in Texas to choose the retail electricity provider with the most attractive conditions of service delivery. The beauty of the deregulation in Texas is that the electricity consumer is not bound to remain with one service provider forever; the electricity consumer has the power unrestricted to switch electricity providers "to find the best service and the best rates to meet your electric needs".

Furthermore, ChooseTexasPower (2018) explains that the rights of the energy consumers in Texas does not only confer on them the ability to shop for, and choose the service providers with attractive conditions, they are also able to exercise their power to switch service providers when they deem fit; and this is because the rights give the electricity consumers (1) The freedom to search for service providers that satisfy their needs in terms of new, cheaper, and affordable rates which could be fixed, variable or indexed rates provided by the competing service providers; (2) It could be that the consumer has changed location to a new utility area that the service of his current retail service provider does not cover; (3) It could be that the consumer is not satisfied with the level of customer service of the current service provider; (4) It could be to find more agreeable terms in terms of the billing system; (5) Where a consumer has a fixed plan such as a month-to-month plan for power supply, the consumer may terminate the plan and switch at the end of the plan period; (6) Where the consumer is involved in a longer contract and he wants to exit early, he may decide to investigate what fees he may be assessed to pay at the point of switching and upon discovery that the power supply may not be different when he switches, he may decide to remain and accept the sub-standard electricity supply of the current provider; (7) Looking at the various retail providers, an electricity consumer may be able to choose from long-term or short-term contracts, and traditional or renewable energy plans; (8) Some retail electricity providers offer rewards programmes to loyal consumers in terms of bill credits, gift cards, or other perquisites for paying bills on time or for introducing new customers; (9) It could be as a result of payment options provided by the service provider; while some accept credit card, others accept online or over-the phone payments (10) It takes only a phone call to switch power providers in Texas; and (11) It could be to get "green" electricity.

Deregulation of the electricity industry has also been found to be successful in Pennsylvania. It has been successful in other parts of the world too. In England, there were initial challenges; but it has picked up. New Zealand, Australia, and Chile have recorded better successes than the United States. The issue therefore is not that deregulation is not workable because of the experiences from the California electricity industry; rather, when a holistic global view is adopted, it is easier to discern that deregulation of the industry is feasible and it is working very well in countries where it has been properly applied. Besides, evaluating the supply side of the market in isolation of the demand side only gives a poor picture of the deregulation in the industry. Also, proper evaluation requires proper risk management and analysis. What one must appreciate therefore is that the restructuring of any system, including that of electricity, is bound to experience some teething problems which require that it be closely monitored; and management must be proactive and flexible enough to be able to respond appropriately to challenges arising from implementation (Sweeny, 2002).

2.2 Sustainable Service Delivery

A service is what a customer receives from a seller or producer in return for his or her money (Mohr and Bitner, 1995). There are two aspects that must be considered in service delivery:

the process of the service delivery and the service outcome. The process of rendering a service leads to an outcome in which the customer is either satisfied or not satisfied with the service experience. The service provider must therefore ensure that considerable attention is paid to the process of designing the system through which the service is produced and delivered to the customers (Brown, Fisk, Bitner, 1994; Mayer, Bowen, and Moulton, 2003).

Consequently, it is expected that the process of delivery will ensure that the service outcome is well received by the customers; hence what should be of paramount importance in the design of the process of delivery is that of meeting the needs and expectations of the customers (Goldstein, Johnston, Duffy and Rao, 2002). These two things of service delivery and service outcome must be perceived to be of good quality by the customers to ensure customer satisfaction, which will, in turn, lead to customer loyalty and retention. The quality of service delivery is measured by the extent to which the particular service is able to meet the customers' expectations (Mohr and Bitner, 1995; Ndingo'ori, 2015).

As Dyllick and Hocketts (2002) suggest, corporate sustainability lies at the interface of economic contribution, environmental performance, and social responsibility; and these three dimensions could be seen as distinct at the operational level but integrated at the strategic level. From these three dimensions, some scholars have suggested that corporate sustainability involves a mix of sustainable development, corporate social responsibility, stakeholder theory, and corporate accountability which form its four pillars. As a new and evolving paradigm, its focus is that managers that are embracing it do so because it emphasizes the stakeholder value which makes an alternative to the traditional growth and profit-maximization model associated with the shareholder value. Although it takes into consideration that corporate growth and profitability are vital in the firms, it goes beyond that to direct attention to the fact that for business organizations to pursue economic goals successfully, they must take into account the societal goals especially those relating to sustainable development which include economic protection, social justice, equity as well as economic development (Wilson, 2003).

On the whole, some of the key ingredients of corporate sustainability include: (1) Corporate transparency which refers to a company having an internal environment which has open and engaging relationship with its external environment in order to improve performance and increase profits. As an open culture, it promotes employee involvement in innovation and creative processes. This is because engaging the community results in a much bigger team; and an inward-looking approach by organizations to realise changes to be made to fulfil environmental needs such as energy efficiency, reduction in product waste and toxicity, etc. Besides, designing innovative products results in higher profits and open communication with stakeholders which give rise to higher levels of information disclosure, clarity, and accuracy; (2) Stakeholder engagement that requires organizations to adopt an internal and external approach in order to be better informed about their social and environmental impacts. Internally, sustainability involves employee education to reduce impacts on the environment through waste reduction, energy efficiency, etc. while externally, it takes the form of engaging stakeholders which include customers, suppliers, community, Non-governmental Organizations, etc., in open and effective communication; and (3) Proactive thinking which suggests that sustainability takes the form of upgrading technology that could transform the product instead of doing away with old materials that could be recycled. This reduces costs and ultimately leads to increase in profits. In the Ikeja electricity supply, we are interested in how the Disco would deliver sustained service to consumers in terms of longevity by being able to operate transparently in the face of current estimated and coded bills; effectively

engage the stakeholders including the consumers; and being committed to proactive strategic thinking that would lead to new technology in power distribution. The Discos are already thinking of disengaging from the industry because of rising cost of service delivery in the face of regulated prices; their sharp practices in form of estimated bills to consumers notwithstanding.

3.0 Methodology

Although there are 11 companies that are in the distribution domain of the electricity supply chain in Nigeria, the focus of this study would be on the electricity consumers under the Ikeja Electricity Distribution Company, Lagos. Furthermore, within the operational domain of Ikeja Electricity Distribution Company, the study concentrated on the electricity consumers in Alimosho Local Government Area of Lagos State.

In this study, the sample size was calculated using Raosoft sample size calculator. With a margin of error of 5%, confidence level of 95%, response distribution of 50%, and a population size assumed to be 20,000, the sample size was 377.

The use of a probability sampling technique would have been preferred in this study but having realised that the sample could include a large number of non-literate consumers who may have to depend on other persons to assist them in completing the questionnaire; the judgmental sampling technique was adopted. This was to ensure that the number of non-literate persons made to complete the questionnaire was reduced; as the judgmental technique relies on the researcher's personal judgmental as to the persons that would understand the questions and could provide independent opinions without relying on other persons' opinions. Data was collected from primary source through questionnaire formulated using Likert scale; and the questionnaire was pre-tested with 105 respondents using test-retest reliability which gave $r_s = 0.90$. In the main study, out of the 377 copies of the questionnaire distributed to electricity consumers in Alimosho Local Government of Lagos State, 315 were returned fully completed which represents 83.55% response rate.

4.0 Data Analysis

Computation in Respect of Hypothesis

Table 2. Analysis of Some Likert Scale Statements by Percentages

No	Statement	SA	%	A	%	U	%	D	%	SD	%	Total	Total %
1.	Deregulation of the electricity distribution in the area currently allotted to the Ikeja Electricity Distribution Company will give room for new entrants into the market that would usher in more efficient	203	64.44	41	13.02	2	0.64	46	14.60	23	7.30	315	100

	services to consumers.												
2.	The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will provide consumers with alternative service providers.	198	62.86	54	17.14	3	0.95	37	11.75	23	7.30	315	100
3.	The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company is likely to lead to fall in prices in favour of consumers because the Company, along with other Discos, will face competition.	205	65.08	43	13.65	3	0.95	40	12.70	24	7.62	315	100
4.	The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will eliminate estimated and coded billing because consumers would be in a position to switch service providers.	212	67.30	34	10.79	0	0	48	15.24	21	6.67	315	100

5.	The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will make the Company and other Discos to be committed to value creation to gain market share and competitive advantage.	202	64.13	46	14.60	2	0.64	27	8.57	38	12.06	315	100
6.	The deregulated electricity market will compel the Ikeja Electricity Distribution Company to jettison the fraudulent estimated and coded billing system and encourage employee commitment to rendering sustainable quality service to customers.	204	64.76	41	13.02	2	0.64	39	12.38	29	9.20	315	100
7.	The competition in the market will give rise to retail electricity distributors in the segment of the Lagos electricity market allotted to the Ikeja Electricity Distribution Company and the emergence of an electricity	205	65.08	38	12.06	1	0.32	41	13.02	30	9.52	315	100

	exchange market in the industry.												
8.	The deregulation of the market will compel the Ikeja Electricity Distribution Company, along with other Discos, to allow the direct sale of electric power to willing buyer s (consumers) by the Electricity Generation Companies	213	68.17	30	9.33	1	0.32	46	14.47	25	7.71	315	100
9.	The deregulation will compel the Ikeja Electricity Distribution Company to eliminate load-shedding, frequent power outages and total darkness with impunity in some areas.	199	63.18	40	12.70	4	1.27	44	13.97	28	8.89	315	100
10.	The presence of new entrants in the area currently allotted to the Ikeja Electricity Distribution Company would compel the Company to install efficient pre-paid meters in consumer households, while the field staff will no longer carry out illegal disconnections and demand	202	64.13	48	15.24	3	0.95	32	10.16	30	9.52	315	100

	bribes from consumers because the consumers would have alternative service providers.												

Source: Field Survey, 2018

The data analyzed in Table 2 shows that out of 315 respondents, 203 or 64.44% strongly agree and 41 or 13.02% agree that deregulation of the electricity distribution in the area currently allotted to the Ikeja Electricity Distribution Company will give room for new entrants into the market that would usher in more efficient services to consumers; 2 or 0.64% undecided; 46 or 14.60% disagree and 23 or 7.30% strongly disagree. Also, 198 or 62.86% strongly agree, 54 or 17.14% agree, 3 or 0.95% undecided, 37 or 11.75% disagree and 23 or 7.30% strongly disagree that the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will provide consumers with alternative service providers.

With regard to the statement that the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company is likely to lead to fall in prices in favour of consumers because the Company, along with other Discos, will face competition, 205 or 65.08% strongly agree, 43 or 13.65% agree, 3 or 0.95% undecided, 40 or 12.70% disagree while 24 or 7.62% strongly disagree. To the statement that the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will eliminate estimated and coded billing because consumers would be in a position to switch service providers, 212 or 67.30% strongly agree, 34 or 10.79%, agree; but 48 or 15.24% disagree and 21 or 6.67% strongly disagree.

In the case of the statement that the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will make the Company and other Discos to be committed to value creation to gain market share and competitive advantage, 202 or 64.13% strongly agree, 46 or 14.60% agree, 2 or 0.64% undecided, while 27 or 8.57% and 38 or 12.06% disagree and strongly disagree respectively. Also, 204 or 64.76% strongly agree, 41 or 13.02% agree that the deregulated electricity market will compel the Ikeja Electricity Distribution Company to jettison the fraudulent estimated and coded billing system and encourage employee commitment to rendering sustainable quality service to customers, 2 or 0.64% undecided, 39 or 12.38% disagree, and 29 or 9.20% strongly disagree.

Furthermore, 205 or 65.08% strongly agree, 38 or 12.06% agree, one or 0.32% undecided; 32 or 10.16% disagree and 30 or 9.52% strongly disagree that the competition in the market will give rise to retail electricity distributors in the segment of the Lagos electricity market allotted to the Ikeja Electricity Distribution Company and the emergence of an electricity exchange market in the industry. Also, 213 or 68.17% strongly agree, 30 or 9.33% agree, one or 0.32% undecided, 46 or 14.47% disagree and 25 or 7.71% strongly disagree that the deregulation of the market will compel the Ikeja Electricity Distribution Company, along with other Discos, to allow the direct sale of electric power to willing buyers (consumers) by the Electricity Generation Companies. With regard to the statement as to whether the deregulation will compel the Ikeja Electricity Distribution Company to eliminate load-shedding, frequent power outages, and total darkness in some areas with impunity, 199 or

63.18% strongly agree; 40 or 12.70% agree, 4 or 1.27% undecided, 44 or 13.97% and 28 or 8.89% disagree and strongly disagree respectively. To the statement that the presence of new entrants in the area currently allotted to the Ikeja Electricity Distribution Company would compel the Company to install efficient pre-paid meters in consumer households, while the field staff will no longer carry out illegal disconnections and demand bribes from consumers because the consumers would have alternative service providers, 202 or 64.13% strongly agree, 48 or 15.24% agree, 3 or 0.95% undecided, 32 or 10.16% disagree and 50 or 9.52% strongly disagree.

5.0 Hypothesis Testing

Hypothesis: The non-deregulation of the distribution segment of the power sector market in Nigeria has a significant effect on sustained service delivery to consumers by the Ikeja Electricity Distribution Company.

Ho: $p \leq 0.5$
H_A: $p > 0.5$

Table 3. Deregulation and Sustainable Electricity Service Delivery

	x	freq(f)	f (%)	fx	$f(x-x)^2$
SA	5	204. 40	64.89	324.45	64.89 $(5-4.13)^2$
A	4	41.50	13.17	52.68	13.17 $(4-4.13)^2$
U	3	2.10	0.67	2.01	0.67 $(3-4.13)^2$
D	2	40.00	12.70	25.40	12.70 $(2-4.13)^2$
SD	1	27.00	8.57	8.57	8.57$(1-4.13)^2$
Total		**315**	**100.00**	**413.11**	**191.77**

Source: Field Survey, 2018

Note: These figures were generated by taking the average of the scores in questions 1-10 of the questionnaire

$$x = \frac{\Sigma fx}{n} = \frac{413.11}{100} = 4.13$$

$$\sigma^2 = \frac{f(x-x)^2}{n} = \frac{191.77}{100} = 1.92$$

$$\sigma = \sqrt{1.92} = 1.39$$

$$Z = \frac{x-\mu}{\frac{\sigma}{\sqrt{n}}} = \frac{4.13-3}{\frac{1.39}{\sqrt{100}}}$$

$$Z = \frac{1.13}{0.139} = 8.13$$

$Z_c = 8.13$
$Z_{t0.05} = 1.645$

Decision: Reject Ho since $Z_c = 8.13 > Z_t = 1.645$ at 0.05 level of significance using the critical value approach. Using the *p*-value approach, reject Ho *p*-value = 0.00001 **< 0.05, and accept** the alternate hypothesis that the non-deregulation of the distribution segment of the power sector market in Nigeria has a significant effect on sustained service delivery to consumers by the Ikeja Electricity Distribution Company.

6.0 Discussion of Findings

The objective of this study was to determine the effect of the non-deregulation of the distribution segment of the power sector market in Nigeria on the sustained service delivery to consumers by the Ikeja Electricity Distribution Company. Accordingly, the hypothesis tested has established that the non-deregulation of the distribution segment of the power sector market in Nigeria has a significant effect on the sustained service delivery to consumers by the Ikeja Electricity Distribution Company.

The specific findings include: (1) deregulation of the electricity distribution in the area currently allotted to the Ikeja Electricity Distribution Company will give room for new entrants into the market that would usher in more efficient services to consumers (2) the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will provide consumers with alternative service providers (3) The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company is likely to lead to fall in prices in favour of consumers because the Company, along with other Discos, will face competition (4) The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will eliminate estimated and coded billing because consumers would be in a position to switch service providers (5) The coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will make the Company and other Discos to be committed to value creation to gain market share and competitive advantage.

Other specific findings include: (6) The deregulated electricity market will compel the Ikeja Electricity Distribution Company to jettison the fraudulent estimated and coded billing system and encourage employee commitment to rendering sustainable quality service to customers (7) The competition in the market will give rise to retail electricity distributors in the segment of the Lagos electricity market allotted to the Ikeja Electricity Distribution Company and the emergence of an electricity exchange market in the industry (8) The deregulation of the market will compel the Ikeja Electricity Distribution Company, along with other Discos, to allow the direct sale of electric power to willing buyers (consumers) by the Electricity Generation Companies (9) The deregulation will compel the Ikeja Electricity Distribution Company to eliminate load-shedding, frequent power outages and total darkness with impunity in some areas (10) The presence of new entrants in the area currently allotted to the Ikeja Electricity Distribution Company would compel the Company to install efficient pre-paid meters in consumer households, while the field staff will no longer carry out illegal disconnections and demand bribes from consumers because the consumers would have alternative service providers.

The finding that the deregulation of the distribution segment of the electricity market in Nigeria will give room for new entrants into the market that would usher in more efficient services to consumers finds support in the work of Crandell and Ellig (1997) who argue that deregulation in the electric power industry is desirable for the reasons that when matched with customer choices, deregulation gives rise to a match between service quality and customer desires; customers experience genuine benefits, not just reallocation of costs among different classes of customers; the lower the barriers to customer choice, the greater benefits customers get; and competitive markets continue to evolve in response to consumer needs.

The other finding that the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will provide consumers with alternative service providers thereby making it easier to switch service providers finds support in the work done

by *the United States Environmental Protection Agency (2017) which confirms that electricity markets in most parts of America have already been opened up for competition; and this has provided the platform for the electricity consumers to choose the type of competitive retail suppliers that best satisfy their needs. In particular, the Agency confirms that the competitive retail market provides consumers the opportunity to choose among competitive retail prices of independent producers in 24 States in America such as California, Texas, and most of the States in the North east. In addition, the Agency also confirms that 18 of these States and Washington DC have provided avenues for consumers, residential and industrial, to have choices with regard to electricity retail service providers for electricity generation options and other sources of power including renewable energy.*

Still in support of lower prices being associated with a deregulated electricity market, ChooseTexasPower (2018) reports that in Texas, the electricity consumers have the power to switch electricity service providers because they know their rights as consumers. The electricity market is deregulated to the extent that consumers are not restricted to meeting their electricity supply from one utility alone and paying the rates dictated by the utility. Also, Sweeny (2002) reports that deregulation of the electricity industry has been found to be successful in Pennsylvania; while England, New Zealand, Australia, and Chile have recorded better successes than the United States.

Also, the finding that the coming in of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company is likely to lead to fall in prices in favour of consumers because the Company, along with other Discos, will face competition is supported by the work of Crandell and Ellig (1997). They argue that deregulation in the electric power industry is desirable for the reason that it leads to substantial reductions in the prices paid by the customers. Furthermore, the finding receives support in the explanations offered by ChooseTexasPower (2018) in respect of the rights of the energy consumers in Texas. It explains that the consumers' rights in a competitive electricity market do not only confer on the consumers the ability to shop for, and choose the service providers with attractive conditions, they are also able to exercise their power to switch service providers when they deem fit. Under the rights, the electricity consumers have the freedom to search for service providers that satisfy their needs in terms of new, cheaper, and affordable rates which could be fixed, variable, or indexed rates provided by the competing service providers; and it could be to find more agreeable terms in terms of the billing system.

Other reasons proffered by ChooseTexasPower (2018) for consumers' switching of service providers include the fact that where a consumer has a fixed plan such as a month-to-month plan for power supply, the consumer may terminate the plan and switch at the end of the plan period; and where the consumer is involved in a longer contract and he wants to exit early, he may decide to investigate what fees he may be assessed to pay at the point of switching and upon discovery that the power supply may not be different when he switches, he may decide to remain and accept the sub-standard electricity supply of the current provider.

Yet other reasons include the fact that in looking at the various retail providers, an electricity consumer may be able to choose from long-term or short-term contracts, and traditional or renewable energy plans. This is made possible because some retail electricity providers offer rewards programmes to loyal consumers in terms of bill credits, gift cards, or other perquisites for paying bills on time or for introducing new customers; while the reason for switching service providers could be as a result of payment options provided by the service provider. While some accept credit card, others accept online or over-the phone payments.

On the other hand, unlike a competitive electricity market where there is the benefit of lowering of prices, a regulated monopoly does not actually lower prices in favour of the customers as seen in some scholarly works which show that electricity consumers are usually not protected by monopoly regulation (Crandell and Ellig, 1997). For instance, the study done by Stigler and Friedland (1962), found that as far back as 1912-1937, when regulation of electric utilities was not common, regulation of the industry had no effect on electric rates. They argue that although utilities in some States in the United States that were regulated recorded lower electric rates after regulation, lower rates were already in existence prior to regulation. This means that regulation is not responsible for the lower rates; it only leads to increase in profits which favour the investors (Jarrell, 1978). The finding by Stigler and Friedland (1997) finds support in another study done by Moore (1970), in which data analysed from 1962, during the "golden age" of the regulation of the industry, that is, when regulation seemed to have done well, shows that regulation reduced electricity prices by not more than 5% and even less.

To further buttress the point that regulation does not reduce prices for the electricity consumers, the works of another group of scholars who argue that although electricity rates were reduced during the late 1970s and early 1980s (Wenders, 1968), these reductions in rates were not as a result of increased productive efficiency. Rather, the reduction in rates is attributable to the fact that regulation succeeds in redistributing wealth from the shareholders to tax payers but did not improve efficiency (Crandell and Ellig, 1997).

Besides, the fact that regulation does not necessarily favour the consumers of electricity in terms of reduction in prices is shown in a related finding in this study that the deregulated electricity market will compel the Ikeja Electricity Distribution Company to jettison the fraudulent estimated and coded billing system and encourage employee commitment to rendering sustainable quality service to customers. This estimated and coded billing system which the Discos inherited from the defunct PHCN is of strong appeal to the Discos because it helps them to defraud the consumers. Unlike the situation in Texas, as ChooseTexasPower (2018) reports, in the absence of alternative electricity service providers in Nigeria, the consumer has all the while been forced to remain with the service provider. Instead of the rates to be reducing based on reduction in the quantity of electricity consumed by consumers, or the consumers given some perquisites by the service providers for brand loyalty as seen with the electricity providers in Texas or in the alternative, that a consumer is able to switch service providers if the service provider is not rendering quality service with commensurate billing.

The results of this study also show that the coming of new entrants into the area currently allotted to the Ikeja Electricity Distribution Company will make the Company and other Discos to be committed to value creation to gain market share and competitive advantage. We have noted that the regulated monopoly in the Nigerian electricity power industry has not in any way reduced rates for the consumers as they are still subjected to the estimated and coded billing system; while many a consumer still experiences epileptic power supply as they existed in the era of the privatized PHCN. As we have noted from the literature, the process of service delivery and the service outcome are two aspects that must be considered in service delivery. The process of rendering a service leads to an outcome which makes the customer to be either satisfied or not satisfied with the service experience. As a result, the service provider must ensure that considerable attention is paid to the process of designing the system through which the service is produced and delivered to the customers (Brown, Fisk, Bitner, 1994; Mayer, Bowen, and Moulton, 2003).

Furthermore, it is expected that the process of delivery will ensure that the service outcome is well received by the customers; hence what should be of paramount importance in the design of the process of delivery is that of meeting the needs and expectations of the customers (Goldstein, Johnston, Duffy and Rao, 2002). The value creation therefore arises from ensuring that these two things of service delivery and service outcome are perceived to be of good quality by the customer, and not by the service provider, in such a way that the customer has value for his money. This gives rise to customer satisfaction, which, in turn, leads to brand and customer loyalty and retention. The quality of service delivery is measured by the extent to which the particular service is able to meet the customers' expectations (Mohr and Bitner, 1995; Ndingo'ori, 2015). The value creation arises from a company's ability to deploy its pool of capabilities to transform its resources (tangible and intangible) to produce goods and services in such a way that it is able to achieve distinctive competencies through providing superior efficiency, superior quality products and services, superior innovation, and superior customer responsiveness in achieving cost leadership and differentiation in a competitive market (Hill and Jones, 2001).

However, in their comparison of regulated monopoly and unregulated competition, Armstrong and Sappington (2006) observe that in an economic conjecture where the regulator was "omniscient, benevolent, and able to fulfil any promise he makes", competition "cannot improve upon regulated monopoly" because that would be a "paradise" of some sort. In such a situation, the regulator would make sure that the ideal range of services brought to the market by the producer are produced at the lowest possible cost; but considering that such a paradise is utopian, they also argue that in practice the regulators lack adequate information about the markets they oversee; and are therefore unable to direct and control the activities of the monopoly producer perfectly. Rather, it is the regulated firm, by virtue of its closeness to the consumers that is better informed than the regulator about the pattern of demand for the regulated services it provides, the minimum possible current cost of delivering the services, as well as the potential of providing it at a lower cost in the future.

With regard to the finding that the deregulated electricity market will compel the Ikeja Electricity Distribution Company to jettison the fraudulent estimated and coded billing system and encourage employee commitment to rendering sustainable quality service to customers, this is supported by the arguments in the literature which show that customers pay higher rates in a regulated electric power environment due to some obvious anomalous assumptions in the billing system. In the process of regulating rates there are inefficiencies associated with regulation which have been identified as being responsible for keeping rates higher in a regulated power market environment than what they should be in: (1) Distorted input choices where electric utilities are granted cost-of-service regulation, whereby regulators estimate costs by looking at the firm's costs for one or more previous years as a guide. With that, they go ahead to approve a price schedule which they hopefully believe would enable the firm to cover its costs and still have a "fair" rate of return. The problem with such regulators is that they create room for the firm to inflate its costs where the approved rate of return is different from the rate the firm actually would require to earn to be able to attract capital. Where the rate is higher than the cost of capital, the firm is encouraged to invest in more capital; but where the rate is lower, the firm would avoid further investment in capital. In fact, some empirical studies on the effect of such distortions show that in the 1960s electric firms were attracted to using more than the cost-minimising amounts of capital (Spann, 1974; Petersen, 1975; Hayashi and Trapani, 1976); (2) Political Influence Costs which are costs arising from the regulatory process itself. The public is compelled to bear additional costs such as utility expenditures to lobby regulators and legislators apart from the

usual budgets for the regulatory commissions (Crandell and Ellig, 1997); (3) Lack of entrepreneurial Incentives whereby public utility regulators discourage competition and lower profits. As a result, there are not entrepreneurial incentives to reduce costs, improve on quality, and generate creative and innovative ideas for new products and services. Hence Primeaux (1977) and Stevensen (1982) are agreed that in the absence of competition, generating costs of electricity utilities are increased from between 6% -10%. On the other hand, a comparative study on monopoly and duopoly electricity markets shows that competition reduces transmission and distribution costs from between 2% and 4% (Nelson and Primeaux, 1988).

The competition in the market will give rise to retail electricity distributors in the segment of the Lagos electricity market allotted to the Ikeja Electricity Distribution Company and the emergence of an electricity exchange market in the industry. This emergence of a market structure for the electricity industry finds support in the work of Abhyankar and Khaparde, (2002). According to them, for a deregulated power industry to function properly, two entities must be created to give room for the wholesale power market place apart from the ISO, the generating companies (Gencos), the transmission companies (transcos), the distribution companies (Discos), and the retail energy service companies (Rescos). These are: (1) System Operation which enables the transmission system to deliver power from sellers' site to the buyers' locations but must be highly controlled under a real-time basis, and (2) Power Market which allows for power producers to sell their power, and for buyers to purchase the power.

The system operation, when created, gives rise to a competitive market mechanism which allows the electricity sellers to offer their products and sell to buyers; and this could be in three ways: (1) Poolco when there is only one buyer. The Poolco is either a government or quasi-government agency which buys power from sellers to sell to bidders; (2) Bilateral Exchange where there are multi-sellers and multi-buyers that exchange power at prices and conditions agreed upon by both parties; and (3) Power Exchange (PX) which operates like the Stock Exchange which is faceless. Here the buyers and sellers talk to the marketplace and not the individual buyers and sellers (Ahbyankar and Khaparde, 2002).

In the case of market models, there are two generally known market models in the electric power industry are: (1) The Pool Model and (2) The Open Access Model. The Pool Model is the model common in the United Kingdom., where the Poolco, as the UK monopsony, buys all the energy generated by the Gencos as a single buyer. The Poolco invites bids for energy and decides the price for a particular period in the future market. On the other hand, in the Open Access model, energy auction and future markets are carried out by an independent body known as the Power Exchange (PX), and the system is operated by another independent body known as the Independent System Operator (ISO) whose responsibility it is to ensure that buyers and sellers are given equal opportunities to buy and sell through open access to the grid. The buyers and sellers could go through bilateral transactions or be part of the energy auction by the Power Exchange. The Open Access Model is common in California in the United States; while Australia, New Zealand, and the European Union employ either the Pool Model or the Open Access model, with minor adjustments to meet their peculiar demands (Abhyankar and Khaparde, 2002).

This is further supported by the *United States Environmental Protection Agency, 2017) which explains that m*arket structure in the United States of America also significantly impacts an electricity consumer's ability to engage in a power purchase agreement (PPA). To engage in a

physical (direct) PPA, an electricity consumer must be in a competitive retail market and the project must be in a competitive wholesale market that is interconnected with the consumer's ISO. To engage in a financial PPA, an electricity consumer can be anywhere in the U.S. and the project must be in a competitive wholesale market.

The other findings show that the deregulation of the electric distribution will compel the Ikeja Electricity Distribution Company to eliminate load-shedding, frequent power outages, and total darkness with impunity in some areas; and that the presence of new entrants in the area currently allotted to the Ikeja Electricity Distribution Company would compel the Company to install efficient pre-paid meters in consumer households, while the field staff will no longer carry out illegal disconnections and demand bribes from consumers because the consumers would have alternative service providers. The way the electricity market in Texas operates explains this well. In Texas, the electricity market is deregulated to the extent that consumers are not restricted to meeting their electricity supply from the utility alone and paying the rates dictated by the utility. Rather, the retail electricity providers purchase energy from the generators at wholesale prices; and the retail service providers compete with each other as they offer consumers options in terms of their various electricity plans. The various electricity retail plans provided by the retail service providers enable the electricity consumer in the deregulated electricity market in Texas to choose the retail electricity provider with the most attractive conditions of service delivery. The beauty of the deregulation in Texas is that the electricity consumer is not bound to remain with one service provider forever; the electricity consumer has the power unrestricted to switch electricity providers “to find the best service and the best rates to meet your electric needs” (ChooseTexasPower, 2018).

The *United States Environmental Protection Agency (2017) further supports this through its argument that c*ustomers in competitive electricity markets can shop various electricity service providers for "competitive" products or "green marketing" products, which are optional product offerings for customers in competitive or deregulated markets to procure bundled renewable electricity from their default utility supplier, or from an alternative competitive electricity supplier.

3.6 Conclusion and Recommendations

The initial argument against competition in the electricity industry was that deregulation in the electricity industry was undesirable because, based on the old technology electricity providers would need to erect electric poles and wires. In a situation where there are more than one service providers on the same street, there could be confusion because everywhere on the same street would be littered with many electric poles and wires of different service providers. To avoid erection of poles by different companies on the same streets that would have every part of the streets littered with poles and wires, it was considered better to allow one company to provide such services in designated areas. However, modern technology has made it easier to diversify electricity generation and distribution activities to include Solar energy, Wind energy, Geothermal energy, Hydrogen energy, Tidal energy, Biomass energy, Hydroelectric energy, Nuclear energy, Fossil Fuels (Coal, Oil and Natural Gas), and Wave energy. Thus, it is now possible to diversity electricity supply to other sources away from hydroelectricity and this has made it easier for different electric companies to provide services to different consumers on the same street. In effect, this allows for deregulation of the market to make it competitive.

Also, there was the tendency for some scholars to discourage deregulation and competition in the electricity industry because of the Californian question. However, the argument of

Sweeny (2002) is persuasive enough to counter this position. According to him, the problem in California was not that of electricity deregulation. Rather, the problem emanated from the price regulation at the retail level and the rigid regulation which disallowed long-term contracts at the wholesale level. His argument is that this was traceable to the gross mismanagement by the California governor and the California Public Utilities Commission (CPUC). However, by June 2001, the electricity crisis in California which had lasted for seven months was over. At that time, wholesale prices had fallen to less than $50/MWh demand for electricity had dropped, new generating plants had come on stream, and more new plants were getting ready for take-off (Sweeny, 2002).

With the explanation, our position is that instead of rejecting deregulation and competition because of the crisis that was seen in California, it is advisable to be on the positive side of competition in the electricity market by embracing and aligning with the successes recorded in Texas, Pennsylvania, England, New Zealand, Australia, and Chile. England had some problems initially, but deregulation is working well there now. In fact, some of those countries are far ahead of the United States of America in the deregulation of the market.

As Sweeny (2002) would suggest, we should stop condemning deregulation as being unworkable; and the deregulation of the electricity market in Nigeria should not be prosecuted the Californian manner. Besides, to achieve better success, the supply side of the market should not be treated in isolation of the demand side as such is bound to lead to crisis. In this regard, while not losing sight of the fact that any restructuring process is bound to generate its own initial unanticipated overt and covert challenges, it is essential to do appropriate risk management and analysis as well as monitor closely each stage and be flexible and respond quickly to changes, when carrying out restructuring in the electricity industry (Sweeny, 2002).

In the light of the findings, we recommend as follows:

1) The distribution segment of the electricity market in Nigeria should be deregulated to bring in retail energy service providers that would usher in the needed competition that would lead to sustained service delivery by the anticipated competing service providers.
2) Accordingly, the landscape should be open for retail eservice providers to emerge in the area currently allotted to the Ikeja Electricity Company. In the same way, retail service providers should be registered in all the areas currently allotted to the other 10 distribution companies currently in the industry in Nigeria.
3) The industry should be allowed to face competition so as to eliminate the discredited estimated and coded billing system now prevalent; and because competition would create the platform for consumers to switch service providers, this is expected to lead to lower prices charged by the emergent retail service providers.
4) However, under the deregulation regime, the role of the Nigerian Electricity Regulatory Commission should be to create an enabling environment for the companies to operate; and to put in place some operational guidelines to ensure that even with the deregulation, the operators do not defraud the consumers.
5) Operating companies should be allowed to enter into service contracts with their consumers as to the type of supply rates (fixed rate, variable rate, or indexed) as well as the type of supply plans (prepaid electricity plan, monthly electricity plan or long-term electricity plan). While the fixed rate ensures a level of predictability in price throughout the period of the contract, variable rate is subject to seasonal fluctuations in the price of electricity and could help the consumer have some savings or pay more, while the indexed is calculated on a standard formula which could prevent the service provider from increasing prices arbitrarily

but the price could be unpredictable since it is tied to energy index. On the other hand, the pre-paid plan is pay as you consume; the monthly plan allows a consumer to switch service providers at the end of the month without any payment of penalties; while the long-term plan could be for as short as three to six months or even three to five years.

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