

Impact of Telecommunication Development on Nigeria Economy

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ABSTRACT

This study is intended to analyze the telecommunication infrastructure and economic growth in Nigeria, which covers the period from 1997-2013. The main objective of this research is to determine the relationship between telecommunication and economic development in Nigeria. The analytical method which was used in this study entails the use of econometric model of ordinary least square (OLS) in the form of stepwise linear regression (best linear unbiased estimation (BLUE)). The data that was used in this study are basically secondary data obtained from Central bank of Nigeria (CBN), statistical Bulletins and annual report, statement of accounts (various years), federal office of statistics (FOS), the Nigerian communication commission (2003 and 2005), news papers, internet, textbooks, journals ,magazines and seminar reports. The findings of this research show that telephone connected lines aids development in Nigeria.

Keywords: Telecommunication, Development, Nigeria & Economy.

Aims Research Journal Reference Format:

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1. INTRODUCTION

The rate of the telecommunications infrastructure in enhancing economic development has been a subject for discourse in the economic literature recently (Gramlich, 1994). The argument is that the development of a modern nation to its full potential in the contemporary world can never be attained without adequate telecommunications infrastructure. This implies that the development of telecommunications infrastructure will have a significant impact on economic growth and development. However, information tools such as telephones and personal computers help to encourage development. World Bank (2005) and Sridhar (2006) show that there are direct correlation between telephone penetration and economic development. All these notwithstanding, most of the values derivable from information development have been concentrated in the developed countries of the world neglecting the developing and less developed countries. For instance, African has less than 3% of the world's main lines although it account for more than 12% of the world's population (Ndukwe 2006). In Nigeria the telephones density is estimated at around five (5) telephones for about 100 people or five percent. As a telephone tends to be concentrated in the cities, access in the cities, access in rural areas is even much more limited or non-existent in many part of the country.

This among others shows that the potentials of the telecommunications infrastructure development in promoting the Nigeria economy are been underutilized. It is as a result of all these, that the study tries to examine the relationship between telecommunication infrastructure and economic development of Nigeria. Nigeria cannot be developed alone by the government (). Other organization also have to join hands with the government in the development of Nigeria by participating in social responsibility, infrastructural facilities like electricity and good roads and provision of information technology which can also serve as the means of enhancing economic growth and building the good will of the organization. Another problem that the Nigeria telecommunication sector is faced with includes capital-intensive and political climate. Government takes time before approving any issue that has to do with telecommunication sector in Nigeria.

In lieu of this, it causes delay in interconnectivity to new operators on timely basis and difficulty to interconnect the various networking in Nigeria. Most telecommunication infrastructure in Nigeria requires a huge amount of money to start up but Nigeria is the inverse because most private companies have limited capital to start up, which makes them neglect it. The mind-set of most telecommunication owners believe that their profit is suppose to be put back into business in order to maximize their profit. Therefore, they do not provide infrastructural facilities and not participating in social responsibility.

The following research questions are very important for this study are: Is there any positive relationship between telecommunication infrastructure developments in Nigeria? Do telecommunication infrastructure enhancing economic development in Nigeria? What are the challenges facing the telecommunications sector in Nigeria? What are the impacts of telecommunication infrastructural development in Nigerian economy?

The broad objective of this study is to assess the performance of government capital investment on telecommunication infrastructure and its impact on economic development in Nigeria. The specific objectives of the study are as follows:

- I. To examine the relationship between telecommunication infrastructure and economic development in Nigeria.
- II. To determine the telecommunication productivity on economic development.

2. LITERATURE REVIEW

The world is rapidly moving towards an economic system based on the continuous and availability of information. Recent advances in telecommunications technology has been an important vehicle for information exchange and knowledge to develop valuable commodity, countries and institution equipped with the perquisite, telecommunication system are rapidly moving into post-industrial and information based expansion. It is an established fact that the economic development of a nation can be accelerated by improvement in the country's ICT (information communication technology) infrastructure, because ICT if well harnessed provides a proper platform for development across all sector of the economy. In Nigeria today, daily activities such as shopping, entertainment, banking, manufacturing, office work, education, medical care, governance and even commuting have become increasingly dependent on information and communication network. It has not also been left out of rapid development of telecommunication industry in the world. The nation's telecommunication industry was liberated with the return of democracy in 1999. This led to the granting of Global System for Mobile Telecommunication (GSM) licenses by the Nigerian Communication Commission (NCC) to three providers: Econet, MTN, and M-tel. This was followed by the licensing of the Second National Operator (SNO), in 2003; that is, Globacom and Universal Access service licenses of 2006 which include fixed telephony, VSAT and internet service providers Also, in March 2008, the NCC gave license to another GSM operator known as Etisalat (Aigbinode, 2008).

2.1 The Trends In Telecommunication Sector In Nigeria

The journey to success in Nigeria's milieu has been long. Telecommunication facilities in Nigeria were first established in 1886 by the colonial administration. At independence in 1960, with a roughly population of 4 million people, the country only had about 18,724 telephone lines. This translated into a tele density of about 0.5 telephone lines per 1000 people. The telephone network consisted of 121 exchanges of which 116 were manual types and only five (5) were automatic. Between 1960 and 1985, the telecommunication sector consisted of the department of post and telecommunication (P&T) in charge of the internal network and a limited liability company, the Nigeria External Telecommunication (NET) limited responsible for the telecommunications gateway to the outside world.

The installed witching capacity at the end of 1985 was about 200,000 lines as against the planned target of about 460,000. All the exchanges were analogue, one telephone for 440 inhabitants; well below the target of telephone line for 100 inhabitants recommended by ITU for developing countries. The quality of services was unsatisfactory. The telephone was unreliable, congested expensive and customer unfriendly. In January 1985, the rest posts and telecommunication department was split into postal and telecommunication division. The latter was merged with NET to form Nigeria Telecommunication Limited (NITEL) a limited liability Company. The main objectives of establishing NITEL was to harmonies the planning and co-ordination of the internal and external telecommunication (Onakoya, 2013).

The services rationalize investments in telecommunication development and to provide accessible efficient and affordable services. However after almost 43years NITEL had only roughly half a million lines available for over 100 million Nigerians. November 1992, the government established an independent regulator- Nigeria communications commission (NCC). The government mandated NCC to establish and foster an environment that will facilitate the participation of the private sector to increase and expand the extremely poor existing infrastructure. This has not been very successful, as telecommunication operates within the economic parameters that were affected by existing socio-economic climate. Recently, the government has issued a new policy framework and set the following sector targets.

- a) Increase telecommunication growth rate to an annual minimum of 13.5% such that 10% of the rural communities are served in the short term, 30% in the medium term and 60% in the long term.
- b) Achieve a teledensity of 1.5 by 2001 by installing 1.5 million mobile telephone lines. Install 8 million fixed lines by 2005 and
- c) Ensure that in the medium term, telephones are within 5 kilometers walking distance instead of the current 50 kilometers.

Implementation of these programs presents huge investment opportunities in supply of infrastructure as well as provision of services. Other opportunities include the local manufacture of equipment that the government will support in a bid to create jobs and enhance skill transfer. In the early 2000s, Nigerian telecommunication plc (NITEL) had roughly half a million lines available to over 100 million Nigerians. NITEL, the only national carrier, had a monopoly on the sector and was synonymous with epileptic services and bad management. For instance, the total number of subscribers of telephones lines as at the end of December 1986 was put at around 230,000 while telex subscribers were only 5,300 in number. Total installed capacity for telephone then was 320,834 and telex 11,577.

The percentage utilization for telephone therefore was 71.6% while telex was approximately 45.7%. However, modernity in telecommunication has provided facilities that make for new class of service, improved revenue generation with properly reviewed tariff policy. In 1996, the country has almost 1,000,00 subscribers to the telephone lines all of which were handle by standard of antennae facing both the Indian and the Atlantic oceans region installed at (No.4) with different geographical locations across the country.

Nigeria operates as domestic satellite system by leasing three Transponders from INTELSAT which are accessed by nineteen standard of earth station in some state capitals of the federation. There is a territorial manager responsible for Telecommunication. Administration in each state except Lagos State because of the relatively large number of switching centers and subscribers in the metropolis, it was considered prudent to have at least two territorial managers. Nigeria embraced Digital Technology since the 1980s with the introduction of digital switches and transmission system (Radio and optic fiber) into the network. Since the beginning of the 90s, mobile telephone service (cellular), paging and Electronic Mail have also been part of the services offered by NITEL (Nigerian Telecommunication plc). At present, however, to a population of one million (1m), the figure of more than half a million telephone lines in the country means in effect, a very low telephone density ratio; though the country has the largest number of telephones in any African country.

On assumption of office on May 29, 1999 Olusegun Obasanjo administration deregulated the telecommunication sector, most especially the much touted granting licenses to GSM service providers and setting in motion the privatization of NITEL. This is a proactive approach by the government to the telecommunication sector as well as on the citizen's access to telephones. Currently MTN, AIRTEL, GLOBACOM, MTEL, and ETISALAT dominate the GSM sector. In some of the present thirty-six States in Nigeria, the proportion of the rural urban dwellers is estimated at over 75% but generally, Nigeria claims an average of about 70%. Some 80% of these inhabitants are engaged in agriculture and other extractive sub sector, that is, nearly three fifths of the total populations are engaged in primary activities of growing food and mining.

Significantly, the agricultural sector in the united states of American employed 44% of that country's population some 100 years ago, but only 2% of the population today is engaged in feeding the entire nation and also exporting food. Today, the population engaged in the information sector is about equal to that in the other entire sector put together that is about 50%. Similar changes are reported in other industrialized societies, as in Europe. These countries are said to have arrived at the information Age or the post-industrial Age, which is assumed generally to have begun in the 1960s with the discovery of the transistor. The information on society is characterized by certain relevant dimension, including: the change from a goods producing to a service society; the centrality of theory in technological innovation.

2.1 Theoretical Literature

2.2.1 The Theory of Unbalanced Growth

This theory has been popularized by Hirschman (1958). According to this consent, investment should be made in selected sector rather than simultaneously in all sectors of the economy. No underdevelopment country possesses capital and other resources in such quantities as to invest simultaneously in all sectors. Therefore, investment should be made in a few selected sectors industries for their rapid development and the economies accruing from them can be utilized or for the development of other sectors. Thus, the economy gradually moves the path of unbalanced growth to that of balanced growth. Economist have express their views in favor of unbalanced growth.

It is the contention of Hirschman (1958) that deliberately unbalancing the economy according to a pre-designed strategy is the best way to achieve economic growth in an underdeveloped country. Hirschman tried to explain growth and development of a nation or economy with social overhead capital (SOC). He defined social overhead capital as comprising those basic services without which primary, secondary, tertiary productive activities cannot function. In social overhead capital (SOC) includes investment on education, public health, communications, transportations and convention public utilities like electricity, water, irrigation and drainage schemes e.t.c.

He stipulated that a large investment in SOC will encourage private investment, later in direct productive activities (DPA), i.e. industrialization. For instance, cheap and frequent supply of electricity power will encourage the establishment of small industries. Unless SOC investment provide cheaper and improved services, private investment in direct productive activities (DPA) will not be encouraged.

2.2.2 The Big Push Theory

The theory was propounded by a man named Paul .N. Rosentern-Rodan (1943). The theory emphasized that there is a need to create high minimum amount of investment to overcome the obstacles of development in an underdeveloped economy &to lunch economic development. Rosentern- Rodan (1943) talked on (3) indivisibilities which are pre-requisite for lunching economic development successful. Among them is the indivisibility in production Function. He added that indivisibilities of inputs, output will lead to increasing returns. He regards social overhead capital as the most important instance of invisibility. The service of social overhead capital comprises of infrastructures like electricity, water supply, roads, networks e.t.c which are directly productive and have a long gestation period.

2.2.3 The Gerschenkron's Great Spurt Theory

This theory was propounded by Alexander Gerschenkron (2000) who pointed that the great spurt in industrialization could take place if 5 pre- requisite are fulfilled. He emphasized that; there should be provision for social overhead capital. Gerschenkron (2000) categorized countries into three groups on the basis of the degree of economic backwardness: advanced, moderately backward and very backward. For a great spurt of industrialization, he noted that advanced nations start their first stage of development with factory in the organizational lead; moderately backward nations with backs and extreme backward with government. But it should not be inferred from this that industrialization is dependent upon the creation of these preconditions. In fact, one precondition can always be created even during the course of industrialization.

Gerschenkron (2000) supported his view by citing the example of England that capital was supplied to the early factories in England from previously accumulated wealth or from gradually plugging back of profit. Extremely backward countries which could not have these preconditions for industrialization were compensated by actions of banks and government. Beside, for a great spurt in industrialization, he emphasized that the adoption of capital intensive techniques. According to him, in an extremely backward country, there would be a very big technological gap between its techniques of production and those of developed countries. It can, therefore, industrialize by adopting most capital intensive techniques of the latter countries for two reasons viz:: First, such techniques help the establishment of import-substitution industries, thereby reducing foreign competition. Secondly, since backward economic have shortage of skilled labour, they use capital intensive and labour saving techniques. The more backward an economy is, the greater is the degree of capital intensity of industrialization. This Gerschenkron (2000) considered the induction of capital intensive techniques essential for economic development, for historical, borrowed technology was one of the primary factors assuring the high speed of development in a backward country entering the stage of industrialization.

2.2.4. Empirical Literature

The pioneering empirical work on telecommunications infrastructure and economic growth in Nigeria is that of Tella *et. al* (2007) has used a system of simultaneous equation model for the time span 1993-2004 and they found out that, after controlling for capital, there is a positive and significant effects of telecommunications infrastructure on economic growth. This finding generated other empirical works with different models; the findings from most of these studies however agree with Tella *et. al* (2007). Eventually, Osoimehin *et. al.* (2010), carry out an appraisal of the effects of investments in telecommunications infrastructure on economic growth in Nigeria measured by gross domestic product.

Using a comprehensive national level data set for a sample period of 16 years (1992-2007) and by employing the ordinary least squared (OLS) regression methods, their results show that telecommunications infrastructure is both statistically significant and positively correlated with economic growth. Olalekan (2012) examines the relationship between real investment in telecommunications and economic growth in Nigeria and he used time series data from 1980 – 2010 and granger causality test to determine the direction of causality between real investment in telecommunications and economic growth. The result shows a unidirectional relationship running from real investment in telecommunications to economic growth, i.e. real investment in telecommunications granger cause economic growth while economic growth do not. Awoloye *et. al.* (2012) carry out a study to explore the effects of telecommunications in Nigeria on gross domestic product for a sample period of 11 years (1999-2009).

Using ordinary least squares technique, their results suggest that telecommunications infrastructure measured by private investment in telecommunications is statistically significant and positively correlated with economic growth. However, it was found that telecommunication contribution to GDP has a negative relationship to the economic growth in Nigeria. Onakoya *et. al.* (2013) investigate the impact of investment in telecommunications infrastructure on economic growth in Nigeria. A multivariate model of simultaneous equations was used. By employing three-stage least squares method, their finding shows that telecommunications infrastructural investment has a significant impact on output of the economy directly through its industrial output and indirectly through the output of other sectors such as agriculture, manufacturing, oil and other services.

The results also document a bi-directional causal relationship between telecommunications infrastructure and economic growth in Nigeria. Sanjo and Ololade (2013) examine the relationship between GSM usage and Business Activities in Nigeria and the study was conducted in Lagos and Ibadan cities. Using analysis of variance (ANOVA) and Pearson product correlation moment the results show that there is a positive and significant relationship between the use of GSM and trading activities in the study areas. Contrary to the findings of the above empirical works, Onakoya (2013) examines the causal relationships between investment in telecommunications and GDP during the transitional period between 1985 and 2003 alongside the impact of the development on the performance of the firms in the telecommunications sector. The finding suggests a strong and positive relationship between economic development and firms' revenue and profit. The regression analysis reveals that the telecommunications sector is statistically insignificant in explaining the GDP. Also, the impact of investment in telecommunications was found to be an insignificant predictor of GDP and vice versa.

2.2.5. Theoretical Framework

This study examined the impact of telecommunication infrastructural development on Nigerian economy under the framework of the theory developed by Mankiw, Romer and Weil (1992). However, since the prevalent usage of GSM is likely to improve the living standard of users. Theoretically, the aggregate improvement will translate into economic growth. The diagram below shows how telecommunication improvement brings about growth through productivity gain.

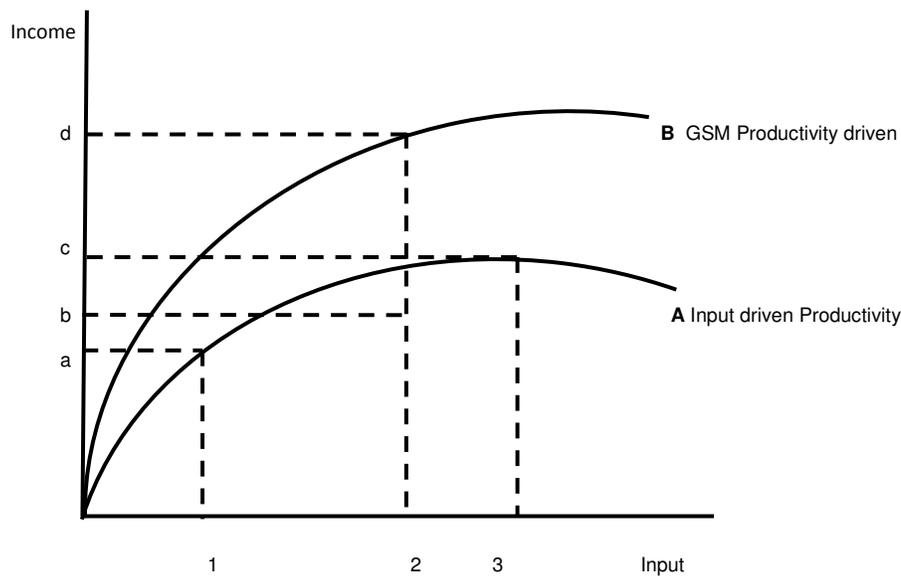


Fig. 1 Input Driven and GSM- Productivity-driven Income Growth Curve

When input (income, human capital and labour) is increased from 1 to 2 units, income increased from a to b with additional inputs, the income is increased but at a decline rate from C to B. This is because it is subject to decreasing returns. A movement along individual productivity functions is a reflection of income gained from additional input. This can cause the productivity to rise upward from A to B and without any additional inputs; output will grow from b to d which comes only from improvement from productivity (production driven income growth). Another source of productivity growth is savings in transaction cost that result from the usage of GSM. In addition, GSM generates economic growth through generation of direct and indirect employment. The direct employment includes those that deal in retail and wholesale trading of recharge cards, handsets and batteries.

3. METHOD OF ANALYSIS

The study employs a stepwise regression analysis and a simple linear regression equation would be employed to establish the telecommunication infrastructural development in Nigeria economy, covering the period between 1999-2014. The variables to be used for this study include both the dependent variable and independent variable. The dependent variable is the Real Gross Domestic Product (RGDP) while the independent variables are GSM connected lines, unemployment, Foreign direct investment (FDI), trade openness and electricity consumption. The method of data analysis that will be used for this study is both the descriptive and analytical tool. Regression analysis will be used to show the relationships that exist between telecommunication infrastructural development and Nigeria economy. The estimation technique to be used in this research work is the ordinary least square (OLS). The ordinary least square (OLS) is used to determine the goodness of fit using unit root test in order to have a best linear unbiased estimation (BLUE) property and also is one of the simplest regressions to estimate.

3.1 Model Specification

The model specification for this study is thus as follows:

The functional form of the model:

$$RGDP=f (Tc, Unemp, Fdi) \text{ ----- (1)}$$

Transforming equation (1) into econometric form for estimation yields

$$RGDP_t =\beta_0 +\beta_1Tc_t +\beta_2unemp_t +\beta_3 fdi_t +\mu_1 \text{ ----- (2)}$$

Where;

- RGDP = Real Gross Domestic Product
- Tc = Telephone Connected Lines
- Unemp = unemployment
- Fdi = Foreign Direct Investment
- β_0 = intercept term
- β_1 = the relative slope coefficients of the parameters
- μ_1 = stochastic error terms

3.2 Data Source:

Secondary data was used for the study and these were obtained from various source like the central bank of Nigeria, Annual Report and statement of accounts (various years), statistical bulletins, federal office of statistic (FOS), the Nigerian Communications Commission (2005 and 2008), news papers, internet, textbooks, journals, magazines and seminar report e.t.c

4. DATA ANALYSIS AND DISCUSSION

4.1 Data Analysis

The data analysis includes three independent variables and one dependent variable. The independent variables are telephone connected lines, unemployment and Foreign Direct Investment (FDI) while the dependent variable is the Real Gross Domestic Product (RGDP). The analysis is for twenty-eight (28) years with a time framework from 1985-2012. These include two main heading, the unit root test and the regression result.

The unit root test was used to test the variables in order to know if the variables are stationary and trending that is, they must not be stochastically distributed. The time series which involves twenty-eight (28) years from 1985-2012 must also be trending, if not there will be a problem and it cannot be used for the analysis. Therefore, in order to use the variables, each of the variables must first be tested, that is why the unit root test was carried out. When the test was carried out the variables were stationary and significant both at 5% and 10%. This implies that, the test is good.

The study performs a stepwise regression analysis and the regression result includes the following thirty-two (32) observation using the R- square and the adjusted R-square which determines the fitness of the models. The R- square is 0.868564 that is 87% and the R- square adjusted is 0.859499 that is 86%. This implies that the goodness of fit is strong enough because it is not far from 100%. The first step regression model result includes thirty-two (32) observations from 1981-2012, telephone connected lines is significant at 0.0000 which is less than 1%. The coefficient shows a positive relationship with economic growth. This implies that a percentage increase in telephone connected lines will lead to more than 80% increase in economic growth (real GDP).

The second step regression result which includes thirty-two (32) observations from 1981-2012, shows that only foreign direct investment (FDI) and unemployment are significant at less than 1%. The coefficient values of foreign direct investment and unemployment shows a positive relationship with economic growth respectively. An increase in foreign direct investment will leads to 780 increases in economic growth. For unemployment, the coefficient is 6.19 and the probability is 0.000 that is 0%, which implies that the variable is significant.

4.2 Discussion

This section discusses the reaction and implication of the coefficient result. If the coefficient is negative, it implies that the independent variable has a negative relationship with the dependent variable and if it is positive, it implies that there is a positive relationship between the independent variable and dependent variable. The first regression result which involves thirty-two (32) observations; for telephone connected lines the coefficient is more than 80% which has a positive relationship, the implication of this result is that, if telephone connected lines increases in the long run, all things being equal, the economy will grow. From an economic point of view, if telephone connected lines increases, it would reduce the cost of business such as cost on mobility and travelling as well as transaction cost. For foreign direct investment, the coefficient is 244.8829 which have a positive relationship; the implication of this result is that, an increase in foreign direct investment will lead to a change in the Real Gross Domestic product (RGDP).

The second step regression result which also involves thirty-two (32) observations; for telephone connected lines, the coefficient is -1445534 which has a negative relationship, the implication of this result is that as telephone connected lines increases, the Real Gross Domestic product reduces and also people will not have access to telephone connected lines. For, foreign direct investment the coefficient is 780.4233, which have a positive relationship, the implication of this result is that, as foreign direct investment increases the Real Gross Domestic Product increases and also for unemployment, the coefficient is 6.19 which has a positive relationship, the implication of this result is that as unemployment increases it will also lead to increase in the Real Gross Domestic Product (RGDP).

The unemployment result in the second step regression model seems not to have meanings. This is because it does not conform to a prior expectation of the study. But, the economic implication of this result may mean a crowd out in the economy which means that an economic growth at long run can cause unemployment if all resources are fully utilize. This may mean a structural unemployment.

5. CONCLUSION

The conclusion is drawn from the findings of this research work which examines the impact of telecommunication infrastructural development on Nigerian economy. We may conclude that over the years, the Nigeria telecommunication infrastructure is playing a significant role in the development of the Nigerian economy. Every human society, from the most primitive to the most advanced level depends on some form of telecommunication network. It will be virtually impossible for any group of people to define their collectives' identities or make decision about their common and binding interest, with communication. Communication network makes society reality. It makes it possible for people to cooperate in order to produce and exchange commodities, to share ideas and information and also to assist one another in times of need.

Indeed, every facet of the basic right of the individual as the right to life, right to personal liberty and dignity, the right to free expression & information and right to free movement, all of which enhance the quality life of the individual are facilitated by telecommunication. It is generally accepted that an accessible telecommunications capability is a prerequisite for national economic development. Those countries that developed their telecommunications services in the private domain of the economy, notably the USA, have demonstrated that telecommunication is a big business and highly profitable. High net worth customers are naturally attractive to the telecommunications entrepreneur, but an account of the social benefits of the communication, which are the center for interpersonal relation and society's integrity, society has to protect and provides for low density and less affluent users.

In Nigeria, there have been at least four national telecommunication development plan, since 1960s in which efforts have been made to accord telecommunications with some measure of priority at least in financial terms. Therefore, the benefit of the existence of the Nigerian Communication Commission is derived from private sector participations in the telecommunication sector in order to manifest in greater efficiency, greater flexibility and less stress in the way people organize their business, economic and social activities. The Nigerian economy is been stimulated and more wealth is created as a result of the provision of incentives for the development of professionalism in telecommunication service delivery and for telecommunication professionals to participate more meaningfully and visibly in the Nigerian economic development.

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