THE IMPACT OF NIGERIA’S TELECOMMUNICATION SERVICES EXPANSION ON NATIONAL ECONOMIC GROWTH

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ABSTRACT

This paper examined empirically the impact of telecommunication service expansion of economic growth in Nigeria. Secondary data on Gross Domestic Product, Telecommunication contribution to GDP (TCgdp), mobile subscribers (GSM) and Private Investment (PI) were sourced from the Nigeria Communication Commission(NCC), Central Bank of Nigeria Statistical bulletin(CBN) and as well as World Bank Development Indicator Database(WDI). The data were analyzed through the pooled Ordinary Least Squared (OLS) regression methods. The study found that there exists a positive relationship between economic growth, proxied by real GDP, and telecommunication (GSM) variables (teledensity, telecommunication contribution to GDP, private investment in telecoms and mobile subscribers) in Nigeria. Having discovered that teledensity has a positive relationship with economic growth, the study recommends that policies that could lead to continual expansion in teledensity rate through the provision of supportive infrastructural base in the sector should be put in place. Moreover, since the telecommunication infrastructure of whatever sort is capital intensive, current sharing of facilities in a joint location compared to the cost of building one’s own infrastructure will hence faster returns on investment and an opportunity to further expand telecoms services in Nigeria.

Keywords: Telecommunication Service, Economic Growth, Teledensity, Private Investment, Nigeria

1. INTRODUCTION

Telecommunication sector across the globe has been identified as one with generic effect on almost all other sectors of the economy. Its function in any economy has also been described as a strategic one that aimed at promoting economic growth and development through its linkages with all other sectors of the economy (Osotimehin, et. al., 2007). The arguments are that the development of a modern nation to its full potential in contemporary world can never be attained without adequate telecommunications infrastructure (Tella, et. al., 2007). For a developing economy like Nigeria, telecommunications infrastructure is not only needed for domestic economic growth, but also as an important tool for increasing competition in the
global world markets. Most of the developed and transitional economies that earlier deregulated their telecommunication sectors to allow more investment and the results they got were not just improved telecommunication capabilities, but also; increased foreign investment, boom in private sector development, more employment opportunities and better education and training facilities (Osotimehin, et. al, 2007).

The spread of telecommunications reduces costs of interaction, expands market boundaries and enormously expands information flows. This supported the work of Roeller and Waverman (2001) claimed that the spread of modern fixed-line telecommunications networks alone was responsible for one third of output growth between 1970 and 1990 in the Organization for Economic Cooperation and Development (OECD) Countries. The assertion that the adoption of different forms of telecommunication facilities have fast spread to the remotest parts of the world was supported by World Telecommunication/ICT Development Report (2010), that, by 2015 more than half of the world inhabitants are expected to be using mobile phones.

The tremendous growth rate in telecommunications network is now making it possible for Nigeria and other developing countries to participate as active players in the world economy. Though, some studies like (Osotimehin, et. al., 2010) and (Tella, et. al, 2007) have acknowledged the positive contributions of telecommunication infrastructure and investment to economic growth in Nigeria, however, the extent of the impact of actual expansion in telecommunication services on economic growth in Nigeria is yet to be explored.

2. LITERATURE REVIEW

According to Ndukwe (2005), the developed world had been able to transform not only their domestic economies, but also increases their competitiveness in the world market, partly due to economic development policies predicated on telecommunications as an essential component of the economic infrastructure. A lot of empirical studies have been conducted on the influence of telecommunication infrastructure and investment in economic growth. An earlier attempt to examine a positive correlation between the level of telecommunication use and some index of economic well being could be traced to Jipp (1963) who studied the relationship between the income of a nation and telephone density, using data for different countries, he found a positive correlation between the two. Also, Bee and Gilling (1967) studied the relationship between telephone facilities and their use and economic performance using data from 29 countries at different stages of development. Garbade and Sibler (1978) proved in their studies that there was statistical evidence that the two innovations in communication technology (the telegraph and trans-Atlantic cable) led to efficient market places worldwide through significant and rapid narrowing on inter-market price differentials. As for Pohjola (2001), he concentrated on 39 countries using data from 1990 to 1995 and observed that IT investment shows 80% gross returns for OECD countries, but developing countries did not experience significant returns.

Belaid (2002) pointed out that a few studies focus on specific telecommunications infrastructure and their role in economic performance. The main ones emphasized on the contribution of telecommunications in reducing transaction cost, increasing total factor productivity of the private sector and diffusion of new technologies, which will help to tackle the problem of developing countries.

Sridhar and Sridhar (2005) warned that telecommunication infrastructure is also a little different from other infrastructure, as a dominant of economic growth because of the existence of network externalities, phenomena that increases the value of a service with increases in the number of users. As a result, the impact of telecommunication infrastructure on economic development is more pronounced as compared to other traditional infrastructure. As for Norton (1992), he demonstrated that convergence could occur if developing countries could add to their stock of telephones rapidly, since they reduce transaction costs.
Rickets (2002) in his work saw telecommunications as facilitating the coordination of information flow, provides opportunities for increasing the efficiency of interaction and coordination, and in this manner influences the success of economic activities. Garbade and Silber (1978) found out that there was statistical evidence that the two innovations in communication technology (the telegraph and Trans-Atlantic cable) led to efficient market places worldwide through significant and rapid narrowing on inter-market price differentials.

Bayes, et. al., (1999) found that half of all telephone calls involved economic purposes such as discussing employment opportunities, prices of the commodities, land transactions, remittances and other business items. They also reported that the average prices of agriculture commodities were higher in villages with phones than in village without phones. Leff (1984) argues that firms can also have more physically dispersed activity with increased telecom services (for instance, encourage the use of telecommunication among the employees) and enjoy economy of scale and scope while Sridhar and Sridhar (2003) studies the impact of telecommunication infrastructure on spatial dispersion of population, using data from the United States. Their result shows that technology is a compliment, not a substitute, for direct interaction.

Cronin, et. al, (1991) used the Granger-Sims and modified Sims tests to confirm the existence of feedback process in which economic activity and growth stimulates demands for telecommunication services. They opined that as the economy grows, more telecommunications service. They pointed out that as the economy grows, more telecommunications facilities are needed to conduct the increased business transactions.

In Nigeria, the entrance of Global System for Mobile Communications (GSM) operators since 2001 has had a positive impact on the culture and life of Nigerians. It generated employment for many unemployed able persons. The industry currently directly employs about 10,000 professionals and is indirectly responsible for another 1,000,000 jobs (Tella, Amaghionyeodiwe and Adesoye, 2007). The industry received global acclaim as one of the fastest growing mobile markets in Africa (Ndukwe, 2006) and has therefore enhanced both foreign direct investment (FDI) and private investment in Nigeria, which has accounted almost 18billion by December 2010. The contribution of the communications sector to GDP has increased from an average of 0.4 percent between 1986 and 1989 to about an average of 5 percent between 2006 and 2010 (NCC, 2011).

According to Soyinka (2008), the mobile phone has empowered the poor by opening up veritable windows of wealth generation for them to get out of the scourge of poverty. Soyinka (2008) and Ndukwe (2008) opined that the GSM business has contributed to the economy in the area of GSM recharge card printing. This has had the effect of saving Nigeria of about 150 million dollars monthly while providing employment and new skills to the dealers. It has also improved entertainment and networking among Nigerians, using short message service, SMS, and the signal calls.

Ariyo and Jerome (2005) for instance, argued that telephone penetration has a positive impact on gross domestic product (GDP) because it provides a stimulant to economic growth and that as economies become more highly developed, they need more communications. Okafor (2007) submits that telecommunications infrastructure becomes a crucial ingredient in the process of economic development in both the developing and the developed countries.

3. THEORETICAL FRAMEWORK

Economic theory postulates that aggregate growth is a function of the increase in the quantity and productivity of capital and labor inputs, with a long run (steady state) growth being driven by technological progress. Growth does not accord any special role in service activities, with the exception of financial services. Intuitively, services such as telecommunications have a powerful influence on economic growth. Low cost and high quality telecommunications will generate economy-wide benefits, as the communications network is a transport mechanism for
information services and other products that can be digitized (Akanbi, 2012). Telecommunication services are crucial to the dissemination and diffusion of knowledge. The spread of the Internet and the dynamism that that has lent to economies around the world is telling testimony to the importance of telecommunications services (Hoekman and Mattoo, 2008).

A vast empirical literature emphasized that telecommunications services make a significant contribution to economic growth (Roller and Waverman, 2001). The infrastructure investments in telecommunication seem to be the most highlighted driver of that contribution. According to economic theory, these investments can lead to economic growth in various ways (Jerbashian, 2011). These investments, while expanding the telecom networks, can increase the availability of telecom products (e.g., wireless and landline services) and motivate higher demand. In addition, according to the conjectures of network economics literature, these investments, while motivating higher demand, can amplify the network externalities. This can increase, for instance, the efficiency of firms in the economy and lead to economic growth (Leff, 1984).

There are two interrelated ways in which investments in telecommunication may impact economic growth. One way is by providing a return on investments in the form of revenues that contribute directly to the overall GDP. The second way in which investments in telecommunication may have a macroeconomic impact is via the spillover effect, where the impact of investments is indirectly caused other economic factors or entities to be more productive (Samoilenko and Weistroffer, 2010).

3. METHOD AND MATERIALS

This study employed secondary data in carrying out this analysis. The data set was tailored towards an empirical framework and it contained information on economic variable such as gross domestic product (GDP) and key indicators for measuring impact of telecommunication services on economic growth. These include mobile telecommunication services, teledensity rate, private investment in telecommunication and contribution of the telecommunication to the GDP. Annual data that characterize the aggregate economy and telecommunication sector were sourced from World Bank Development Indicator Database, Central Bank of Nigeria (CBN) statistical bulletin and Nigeria Communication Commission (NCC) publications. The data was sampled between 1999 and 2011. The analysis was restrained to this sample period so as to prevent complication that might arise from inconsistency and non-availability of data prior to 1999. It was obvious that before 1999 that size of telecommunication infrastructure in Nigeria was very small and as a result, its effect on Nigeria’s whole economy would be marginal. This study adopts Ordinary Least Square (OLS) analysis to examine the effects of telecommunication services on economic growth.

3.1 MODEL SPECIFICATION

To ascertain the relationship between GDP and telecommunication services, the study adapted Awoleye, Okogun, Ojuloge, Atoyebi and Ojo (2012). The variables were constructed as:

\[ RGDP = f(TC_{gdp}, TD, GSM, P.I) \]

When equation (1) was expressed in econometrics form, it becomes;

\[ GDP_R = a_0 + b_1 TC_{gdp} + b_2 GSM + b_3 P.I + b_4 TD + e \]

Taking the natural logarithm in order to linearize both sides of the equation above which gives:
LogGDP = a + b₁Log TCgdp + b₂LogGSM + b₃LogPI + b₄TD + e… (3)

Where; GDP = Real Gross Domestic Product, TCgdp = Telecommunication Contribution to GDP, TD = Tele-density, GSM = Number of Global System for Mobile communication and fixed wireless subscribers in circulation (mobile and fixed lines), P.I = Private Investment and e = the error term. The stochastic (error) term, e, takes care of all other factors, not accounted for by the independent variables.

4. RESULT AND DISCUSSION

This section focuses on the presentation of empirical results, analysis and discussion of findings based on the collected relevant data pertaining to the variables under study and in line with the models specified in the previous section of this study, the data collected from various sources were analyzed using regression analysis.

4.1 UNIT ROOT TEST

The results of the unit root test reveal that real gross domestic product (LOGGDP), and Mobile Telecommunication (LOGGSM) are stationary at second difference I (2) while private investment in telecommunication (LOGPI) and teledensity (TD) are stationary at the level I (0). Only telecommunication contribution to GDP at 5% level of significance.

Table 1: Unit Root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF Statistics</th>
<th>Critical Values</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOGGDP</td>
<td>-5.707442</td>
<td>-4.4613 @1% -3.2695 @5% -2.7822 @10%</td>
<td>Stationary at second difference. I(2)</td>
</tr>
<tr>
<td>LOG(TCgdp)</td>
<td>-3.0599</td>
<td>-4.2207 @1% -3.1801 @5% -2.7349 @10%</td>
<td>Non stationary at level I(0), first difference I(1) and second difference I(2).</td>
</tr>
<tr>
<td>LOGGSM</td>
<td>-0.85416</td>
<td>-4.326 @1% -3.2195 @5% -2.7557 @10%</td>
<td>Stationary at level I(0)</td>
</tr>
<tr>
<td>TD</td>
<td>-4.331955</td>
<td>-4.4613 @1% -3.2695 @5% -2.7822 @10%</td>
<td>Stationary at level I(0)</td>
</tr>
<tr>
<td></td>
<td>-4.423954</td>
<td>-4.4613 @1% -3.2695 @5% -2.7822 @10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.424455</td>
<td>-4.2207 @1% -3.1801 @5% -2.7349 @10%</td>
<td></td>
</tr>
</tbody>
</table>

The regression results gotten, the value of the constant term (intercept) is 4.819546. This simply implies that if all the explanatory variables are held constant, the real GDP is 4.819546. A percentage increase in telecommunication contribution to gross domestic product (TC) will cause a -0.045537 unit fall/decrease in Gross Domestic Product (GDP). On a contrary, a percentage change in mobile telecommunication subscribers (GSM) will cause a 0.109760 rise in Gross Domestic Product (GDP). This means that when more people are actively connected to mobile (GSM and fixed) operators’ income will increase and Gross Domestic Product reacts positively.

- A percentage change in the private investment in telecommunication (PI) will cause a 0.085975 unit rise/increase in Gross Domestic Product (GDP). This implies that more foreign investors are attracted to the telecoms sector, it will fill the gaps Nigeria needed for growth.
A percentage change in tele-density rate will cause 0.108044 unit rise in Gross Domestic Product (GDP). This means that as more mobile penetrates the market with an increased population, tele-density rate will be improved consequently GDP will be induced. The error correction model (ECM) of 0.064822 explains other variables that are not included in the model.

<table>
<thead>
<tr>
<th>Sample Results</th>
<th>Coefficients</th>
<th>T-Values</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.819546</td>
<td>61.89506</td>
<td>0</td>
</tr>
<tr>
<td>LOGTC</td>
<td>-0.045537</td>
<td>-3.57645</td>
<td>0.0117</td>
</tr>
<tr>
<td>LOGGSM</td>
<td>0.10976</td>
<td>5.694459</td>
<td>0.0013</td>
</tr>
<tr>
<td>LOGPI</td>
<td>0.085975</td>
<td>4.999131</td>
<td>0.0025</td>
</tr>
<tr>
<td>TD</td>
<td>0.108044</td>
<td>3.546796</td>
<td>0.0121</td>
</tr>
</tbody>
</table>

\[ \text{LOGGDP} = 4.819546 - 0.045537 \times \text{LOGTC} + 0.109760 \times \text{LOGGSM} + 0.085975 \times \text{LOGPI} + 0.108044 \times \text{TD} + 0.064822 \times \text{ECM(-1)} \]

A brief look at the adjusted R\(^2\) value of 0.993786 indicates that after removing the effect of insignificant regressors (explanatory variables), about 99.4% variation in the real GDP is still accounted for by the independent variables. Therefore, the model is a good fit as only less than 0.6% of systematic variation is left unaccounted for by the model.

The Durbin-Watson (D-W) statistic of 2.003528 shows that the model has no problem of serial autocorrelation. The prob (F-statistics) of 0.00 means that the probability that all of the regression coefficients are zero is 0.00, thereby showing that the regression model is useful in determining relationship that exists between telecommunication services and economic growth in Nigeria. However, the F-statistics, which indicate the significance of all the explanatory variables taken together, was found to be highly significant at 1% and 5% level of significance and the mean of the dependent variable is greater than the standard error of the estimates.

5. CONCLUSION AND RECOMMENDATION

The study reveals that there is a relationship between telecommunication services and economic growth in Nigeria from 1999-2011. It was discovered that there is a positive relationship between GDP and telecommunication services. Thus an increase in variables used (teledensity, private investment, mobile subscribers and telecommunication contribution to GDP) except a telecommunication contribution to GDP will lead to increase in the GDP of the country. The findings are supported by Technophilic view: Posu (2006). The technophiles believe that there is a positive relationship between two variables. In supporting the findings of this study, a positive relationship exists between telecommunication services and economic growth.

As a result of the findings, it was recommended that the government should adopt policies that can be used to regulate the activities of the private investors in the telecommunication sector to improve telecommunication services and economic growth.
Government should increase its investment in the telecommunication sector, and on basic infrastructural facilities needed to attract investors to invest in telecommunication services and this will improve economic growth. Having discovered that tele-density has a positive relationship with economic growth, the government should continue to expand tele-density rate in the sector through subsidizing call rates.

REFERENCES


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