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Telecommunication Sector and Economic Growth of Nigeria: A Post Deregulation Evaluation

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Abstract

The study employed multiple regression analysis model specified based on hypothesized functional relationship between telecommunication infrastructure development and economic growth of Nigeria during post deregulation period. The model for the study was estimated using the Ordinary Least Square (OLS) technique, and further evaluation was executed using chi-square to investigate the views of respondents on whether GSM has increased market access and reducing distribution cost in carrying out daily economic activities in Nigeria. The outcomes showed that telecommunication has influenced the country's economy by increasing market access and reducing distribution cost. Therefore, to enhance economic growth in Nigeria, government should issue more licenses to GSM operators in order to allow for healthy competition among the GSM operators. On the other hand, operators should consider the strategy of co-location and infrastructure sharing for further improvement and reduction in cost of running telecommunication business in Nigeria.

Keywords: Telecommunication sector, economic growth, Nigeria, post deregulation period, market access, distribution cost.

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Introduction

The entire world is rapidly gravitating toward system of economy anchored on availability of information in a continuous and ubiquitous manner. Recent advances in telecommunications technology have been an important vehicle in permitting information exchange to develop as a valuable commodity (Alleman,n.d.).

The outcome of current foreign data reveals that advances in telecommunications services amount to socio-economic and financial development of a nation. Africa as a continent has taken up the issue of linking the digital difference as its means to its sustainable economic development. Nigeria is not placed behind. The government of Nigeria has ensured quick deployment and liberation of the telecommunication sector especially in the past few years of democratic regime (Ndukwe, 2006). The major economic dividend of improved telecommunications is improved efficiencies in other productive sectors as well as reduction in transport costs, reduction in transaction costs, improvement in marketing information, etc.

Development of Telecommunication in Nigeria in the post Deregulation Period

In 1999, Nigeria had about 400,000 fixed lines and about 20,000 analogue wireless lines (Ndukwe, 2008). Following the liberalization of the telecommunications industry by the Democratic Government in 1999, and the privatization of mobile licenses in year 2001, the telecommunications industry in Nigeria has experience a phenomenal growth. This was accomplished through NCC's commitment to full, fair and transparent liberalization. In pursuit of this, since the year 2001, the Commission has awarded licensed to numerous Digital Mobile Operators (DMOs), Fixed Wireless Access Operators (FWAs), Long Distance Operators (LDOs), Internet Service Providers (ISPs), a second National Carrier and in recent time, introduced the unified access service license (UASL), to promote competition in all segments of the market.

Today, cell phones are assessable all sectors of the country's society. The country's economy has experienced marvelous growth, the citizenry have been enriched, information and communication is now widely spread, industries and entrepreneurship have sprung up. The face of Nigeria is forever changed. From tele-density figures of 0.4 lines per 100 inhabitants recorded in year 2000, by October 2008, Nigeria had recorded tele-density figures of 42 lines per 100 inhabitants, and an active subscriber base of nearly 59 million lines (Ndukwe, 2008). Furthermore, nationwide, individual states are covered by both voice and data services via the GSM and the CDMA technologies. Today, the Nigerian telecommunications market is the fastest growing telecommunications market on the African continent. The wireless revolution, the internet phenomenon, the broadband capabilities and the massive deployment of national and intercontinental optic fiber highways have expedited global access to information resources, and positively affected the manner people of the world live and transact business.

In spite of the achievements witnesses, yet there are millions of Nigerians with little or no access to ICT services, gratitude to inter alia, the paucity in network infrastructure. To aid quick rollout of infrastructure developments, the Commission adopted the Unified

Access Service Licence (UASL) that authorizes licensees to provide Digital Mobile Telephone, Fixed Telephony, National Long Distance operation, International Data Access and Internet Services, all in one license. Fast ICT development is certain in Nigeria as indicated by large demand for licenses

Furthermore, in addition to its numerous functions, the Commission is nevertheless responsible according to the Nigerian Communications Act (NCA) 2003 with the deployment of Universal Service for all Nigerians, as the Federal Government is determined to ensure all Nigerians access to telecommunications services. Apart from the designing of USPF to perfect the rapid rollout of services to unserved and underserved urban and rural areas, the Commission in its strategic focus is seriously following up the manifestation of ICT access to all citizens of Nigerian within a 5 kilometre radius (Ndukwe, 2008). Without the fast roll out of backbone infrastructure and transmission facilities, these goals are unattainable in Nigeria. In order to bridge the digital hollow in the shortest time-frame, wireless communications, VSAT and internet connectivity hold the key. Private sector investment is essential for its attainability. It is true that the industry experienced marvelous growth in terms of the amount of private sector investment introduced into the sector already. The important concern of universal and more reaching access nevertheless requires a little more fast rollout of services and is the reason for the need for extra private sector money.

Literature Review

According to Lee et al (2009), the relationship between telecommunications investment and economic growth has been examined in various ways. Granger causality tests and modified Sims tests have been deployed by many time series analysis and emphasis has been on the strength and direction of the causal relationship between telecommunication infrastructure investment and economic growth. For example, Cronin et al (1991 and 1993b) and Wolde-Rufael (2007) confirmed a two-way causal relationship in the U.S., between telecommunications infrastructure investment and economic growth. Beil et al. (2005) nonetheless conducted Granger-Sims causality tests for a time series of 50 years in the U.S., and suggested a one-way causality from economic growth to telecommunications investment. Dutta (2001) introduced Granger causality tests for a cross section of 30 developing and industrialized countries in three different years, and discovered a bi-directional causality for both developing and industrialized countries. Perkins et al (2005) also identified a bi-directional causality in South Africa using a PSS F-test (Pesaran et al., 2001).

On the contrary, effort has been made by a few studies to quantify the impact of telecommunications on economic growth by incorporating telecommunications infrastructure investment explicitly into a macro (aggregate) production function or a cross-country growth framework. Madden and Savage (2000) extended Mankiw et al (1992) to develop a supply-side growth model where teledensity (the number of main telephone lines per 100 persons) and the share of telecommunications investment in national income were controlled for as telecommunications capital proxies. The outcome of data on 43 countries over 1975-1990 revealed a significant positive cross-country relationship between telecommunications capital and economic growth. Roller and Waverman (2001) in a related study endogenized telecommunications infrastructure into

aggregate economic activity. A micro model was specified at first of the demand for and supply of telecommunications infrastructure, and jointly estimated the micro model with the macro production function. A significant causal relationship between telecommunications infrastructure and aggregate output was revealed.

More recently, Datta and Agarwal (2004) expanded Barro (1991) and Levine and Renelt (1992) cross-country growth framework to examine the effects of telecommunications infrastructure on economic growth. In a dynamic panel model built upon Islam (1995), they controlled for lagged real gross domestic product (GDP) per capita to test for convergence while testing separately the direction of causality between the teledensity and economic growth using the first-lagged values of teledensity (Lee et al., 2009).

Purpose of the Paper and Methodology

Purpose

The main aim of this paper is to investigate the impact of telecommunication infrastructure development on economic growth of Nigeria during post deregulation period. Specifically, it attempts to examine how GSM has increased market access and reduced distribution cost in carrying out daily economic activities in Nigeria.

Hypothesis

Ho: Deregulating of telecommunication infrastructure development has no positive impact on economy growth of Nigeria.

Ho: GSM has not increased market access and reduced distribution cost in carrying out daily economic activities in Nigeria.

Methodology

The paper adopted ordinary least square (OLS) econometric technique. The OLS model estimation technique yields relevant statistics that enhances analysis and evaluation in addition to numerical value of model parameters. The estimates are further evaluated for statistical significance of accepting or rejecting the research hypothesis. The bases of evaluation are the t-stat, F-stat, and Durbin-Watson statistic respectively. Explanatory power of the model, as a measure of goodness of fit, is determined using the coefficient of determination (R^2 and adjusted R^2). The initial econometric model is adopted from Gold (2011) and specified as follows:

$$GDP = \psi_0 + \psi_1 GET + \psi_2 TLD + \psi_2 ELY + \phi_i \quad (1)$$

where GDP is gross domestic product; TLD stands for GSM Tele-density; GET represents government expenditure on telecommunication; EL denotes electricity; ψ_0 *is constant factor;* $\psi_1 \ldots \psi_3$ *are Slopes of the variables for estimation; and* ϕ_i *is error term.*

The estimated model is discussed in line with a priori expectations for clarity on the nature of the relationship between the dependent and independent variables. The a priori

expectation is summarized as follows: $\psi_1, \psi_2, \psi_3 > 0$. Data employed for the analysis covered the period 1999-2012. They were basically secondary data collected mainly from central Bank of Nigeria's statistically bulletin, Annual Report and Statement of Account (various years), National Communication Commission (website) and National Bureau of Statistics.

In conducting stationarity tests of the variables in equations 1, the data were subjected to Augmented Dickey-Fuller (ADF) unit root test which is derived from Dickey and Fuller (1979, 1981). The ADF test entails estimating the following equation:

$$\Delta G_t = b_b + b_{2t} + dG_{t-1} + \sum_{i=1}^{m} a_i \Delta G_{t-1} + \varepsilon_t \quad (2)$$

where: G_t is the variable of interest; ε_t is a pure white noise error term; t is time trend; Δ is difference operator; b_1,b_2,d and a_i are various parameters. In the ADF approach, the idea is to test whether d=0 (the null hypothesis is that the variable in question has a unit root (i.e. it is not stationary) (Obioma and Ozughalu, 2010).

In order to investigate the views of respondents on GSM increasing market access and reducing distribution cost in carrying out daily economic activities in Nigeria., a researchers' designed questionnaire was randomly administered to banks, traders and schools. 45 copies of questionnaires were administered to each category of respondents. 135 copies of questionnaire were distributed out of which 116 were retrieved after the respondents had filled them. This gives a retrieval rate of 85.9%. The data obtained were analysed using frequency counts and percentages while Chi-square was used to test the hypothesis which the study sought to test. Chi-square is calculated by summation of the observed value minus the expected value divided by the percentage used:

$$\text{Thus} \quad {}^2 = \Sigma \frac{(fo-fe)}{Fe} \quad (3)$$

Where fo is observed frequency; fe means expected frequency; Σ is the sign for summation; ^{2} is the notation for Chi-Square; d.f stands for the degree of freedom (d.f = (r-1) (c-1)); c is number of columns; and r is number of rows.

Result and Discussion

Before proceeding for estimation, The Augmented Dickey-Fuller (ADF) unit root test reported in table 1 (see Appendix) shows that most of the variables were stationary at 2nd difference except gross domestic product (GDP) variable which is stationary at 1st difference and significant at 5% level of significant.

Table 1: Unit Root Test-Augmented Dicky-Fuller

Variables	ADF Statistics	5%	Order of integration
GDP	-3.540669	-3.119910	I(1)
GET	-3.570643	-3.44920	I(2)
TLD	-7.253874	-3.144920	I(2)
ELY	-6055162	-3.144920	I(2)

From table 2 in appendix, the result shows inverse relationship between government expenditure (GET) and GDP which is against the a priori expectation. It indicates that a unit increase in GET will lead to decline in GDP by 3.715195 units. However, the sign borne by the parameter estimate of GET does not conform to the a priori expectation. This is attributed to government disengagement in funding the sector during deregulation period.

From the regression result the sign of TLD variable conforms to "a priori expectation. The coefficient of TLD is about 142144.3, meaning that holding other variables constant, 1unit increase in TLD leads to an increase in the economic growth (GDP) by about 142144.3 units. However, TLD is statistically insignificant meaning that even though TLD is positively related to GDP, it does not really influence economic growth significantly. This is because most Nigerians have cultivated the habit of having two to three SIM cards though this increase the tele-density but these SIM cards are not efficiently used, therefore, it contribution to GDP is altered. Also in rural area where electricity and network is not efficiently provided, the population in this area may have surplus phones and SIM cards which in no dispute increase tele-density, but do not contribute to GDP hence, they are not efficiently used. In some parts of the country, especially in remote villages, people still climb mountains and trees to access the network and this result to inefficient use of their phones and SIM cards, therefore altering its contribution to GDP.

Furthermore, the result shows that electricity (ELY) has a positive influence on economic growth. It reveals that a unit rise in electricity brings about a 333.2223 unit increase in GDP. This is because, since the privatization of NEPA in 2013 Nigerian government has not stopped funding and regulating the sector, thereby reducing the monopoly power of the sector. This result conforms to a priori expectation and it is statistically significant at 5% level.

The coefficient of determination (0.989) indicates that 99% of the variations in gross domestic product is explained by GET, TLD and ELY. The F-statistic (332.86) also indicates that the overall fitness of the model is good. The D.W-statistic (2.14) is approximately 2.00, using the rule of thumb. This implies that there is absence of first order serial correlation (or autocorrelation) in the model.

Table 3 presents the results on socio-economic characteristics of respondents in the study. The frequency distribution reveals that respondents from banks were 31.04%, 34.48% of respondents were traders and also 34.48% of respondents were from schools.

Table 3: Characteristics of Respondents

Category	Responses	Frequencies (%)
Banks	36	31.04
Traders	40	34.48
Schools	40	34.48
Total	116	100

Table, 4: Has GSM eased managerial activities in day to day running of your banking, trade and school business?

Responses	Bank	Trade	School	Total	Percentage
Yes	32	40	37	109	94.0
No	4	0	3	7	6.0
Total	36	40	40	116	100

Source: fieldwork (2014)

From table 4 above, 94.0 per cent of the respondents agree that, GSM has eased managerial activities in day to day running of banking, trade and school activities, while 6.0 per cent of the total respondents disagree with the notion. Since, 94.0 per cent is greater than 6.0 per cent; we therefore, conclude that GSM has eased managerial activities in day to day running of banking, trade and school activities in Nigeria.

Table 5: Has GSM increase customers'/students' knowledge of banking transaction, goods and services and education carrier

Responses	Bank	Trade	School	Total	Percentage
Yes	34	33	30	97	83.6
No	2	7	10	19	16.4
Total	36	40	40	116	100

Source: fieldwork (2014)

Table 5 above shows that, 83.6 per cent of the respondents assert that GSM has increased their knowledge about the economic activities/educational carrier while 16.4 per cent disagreed. Hence, 83.6 per cent is greater than 16.4p percent we therefore accept that GSM has increased their knowledge about the economic activities/educational carrier in Nigeria.

Table 6: Has GSM increased market access and reduced distribution cost in carrying out daily economic activities in Nigeria?

Responses	Bank	Trade	School	Total	Percentage
Yes	36	40	30	106	91.4
No	0	0	10	10	8.6
Total	36	40	40	116	100

Source: fieldwork (2014)

Table 6 shows responses to the question: has GSM increased market access and reduced distribution cost in carrying out daily economic activities in Nigeria? The table reveals that above, 91.4 per cent of the respondents agreed that GSM penetration reduced distribution cost in their economic activities in banking sector, trade and school. While 8.6 per cent of the respondents disagree to the claim that GSM penetration has actually reduced the cost of distribution in their economic activities, therefore, 8.6 per cent is insignificant compare to 91.4 per cent.

To test **hypothesis II**, responses from table 3 were used. The calculated Chi-Square is 79.4 and the tabulated Chi-Square at 0.05 per cent level of significance is 3.84. Since X^2

calculated is greater than X^2 tabulated i.e. 79.4>3.84, the decision rule is to reject the Ho and accept H_1. Therefore, we conclude that GSM has effect in increasing market access and reducing distribution cost in carrying out daily economic activities in Nigeria.

Conclusion and Recommendation

Mobile phones usage in Nigeria has become very essential for individuals and industries in both the urban and rural areas. It is undeniable that the output of industries has increase and the life of many Nigerians improved within the era of improvement in telecommunication industry (Asogwa, 2013). Though, economic growth is principally a function of variation in some macroeconomic fundamentals, the focus of this paper is on investigating the impact of telecommunication infrastructure development on economic growth of Nigeria during post deregulation period. It specifically examined whether GSM has increased market access and reduced distribution cost in carrying out daily economic activities in Nigeria. The findings revealed that telecommunication has influenced the economy by increasing market access and reducing distribution cost. Therefore, to enhance economic growth in Nigeria, government should issue more licenses to GSM operators to ensure healthy competition among the GSM operators. On the contrary, operators should look into the strategy of co-location and infrastructure sharing for further improvement and reduction in cost of running telecommunication activities in Nigeria. In that regard, government should supply adequate electricity to the rural area to encourage rural telephony and enable Nigerians to use their phones and SIM cards efficiently. Tele-density will definitely increase.

Interests of the consumer of telecommunication services should be adequately protected by the Nigeria Communication Commission (NCC) through promoting competitive pricing of such services and combating the abuse of market power (Gold, 2011).

References

Alleman,J., Hunt, C., Michaels,D., Mueller,M.,Rappoport,P.,andTaylor, L. (n.d.). Telecommunications and economic development: Empirical evidence from Southern Africa. http://www.colorado.edu/engineering/alleman/print_files/soafrica_paper.pdf

Asogwa, F. O. (2013). The impact of telecommunication expenditure on economic growth in Nigeria. *Journal of Economics and Sustainable Development*. 4(13), 40-44.

Barro, R. (1991). Economic growth in a cross section of countries, *Quarterly Journal of Economics*, 106(2), 407-443.

Beil, R., Ford, G., and Jackson, J. (2005). On the relationship between telecommunications investment and economic growth in the United States. *International Economic Journal*, 19(1), 3-9.

Cronin, F., Parker, E., Colleran, E. , and Gold, M. (1991). Telecommunications infrastructure and economic growth: An analysis of causality, *Telecommunications Policy*, 15(6), 529-535.

Cronin, F., Parker, E., Colleran, E., and Gold, M. (1993). Telecommunications infrastructure investment and economic development. *Telecommunications Policy,* 17(6), 415-430.

Datta, A. and Agarwal, S. (2004). Telecommunications and economic growth: A panel data approach. *Applied Economics,* 36 (15), 1649-1654.

Dutta, A. (2001). Telecommunications and economic activity: An analysis of granger causality. *Journal of Management Information System*, 17(4), 71-95.

Gold, K. L. (2011). Aggregate analysis of the impacts of telecommunication infrastructural development on Nigerian economy. Proceedings of the 1st International Technology, Education and Environment Conference (c) African Society for Scientific Research (ASSR).Co-published by: *Human Resource Management Academic Research Society*, 1(1), 213-221. http://www.hrmars.com/admin/pics/230.pdf

Islam, N. (1995). Growth empirics: A panel data approach. *Quarterly Journal of Economics*, 110(4), 1127-1170.

Lee, S. H., Levendis, J., and Gutierrez, L. (2009). Telecommunications and economic growth: An empirical analysis of sub-Saharan Africa. Serie Documentos De Trabajo, No. 64, Mayo. http://www.urosario.edu.co/urosario_files/fe/fe76de8a-3f23-445f-b6f8-390f1dcf8f32.pdf

Levine, R., and Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review*, 82(4), 942-963.

Madden, G. and Savage, S. (2000). Telecommunications and economic growth. *International Journal of Social Economics,* 27(7), 893-906.

Mankiw, N., Romer, D., and Weil, D. (1992). "A contribution to the empirics of economic growth. *Quarterly Journal of Economics*,107(2), 407-437.

Ndukwe, E. C. A. (2008). The role of telecommunications in the development of Nigeria's infrastructure: The latest government initiative to stimulate investment and private sector involvement. Being a paper presented at Nigeria Infrastructure Exhibition and Conference International Conference Centre, Abuja, Nigeria 2 –4 december. http://www.ncc.gov.ng/archive/speeches_presentations/EVC%27s%20Presentation/2009/role_telecoms.pdf.

Ndukwe, E.C.A. (2006). An overview of the Nigerian telecommunications environment and successful initiatives to promote communications development. *A paper delivered at CTO Exhibition* at Transcorp – Hilton Hotel Abuja on 10th October. Retrieved from ncc.gov/…/EVC'S%20CTO%20 presentation 101006. pdf.

Obioma, E. C., and Ozughalu, U. M. (2010).An Examination of the Relationship between Government Revenue and Government Expenditure in Nigeria: Cointegration and Causality Approach. *Economic and Financial Review* ,Volume 48(2), 35-57.

Pesaran, M., Shin, Y., and Smith, R. (2001). "Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*,16(3), 289-326.

Perkins, P., Fedderke, J., and Luiz, J. (2005). An analysis of economic infrastructure investment in South Africa. *South African Journal of Economics,* 73(2), 211-228.

Roeller, L.H., and Waverman, L. (2001). Telecommunications infrastructure and economic development: A simultaneous approach. *The American Economic Review*, 91(4), 909-23.

Wolde-Rufael, Y. (2007). Another look at the relationship between telecommunications investment and economic activity in the United States. *International Economic Journal*, 21(2), 199-205.

Appendix

Table 2 Regression result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GET	-3.715195	10.73544	-0.346068	0.7358
TLD	142144.3	115297.9	1.232843	0.2433
ELY	333.2223	128.2017	2.599203	0.0247
C	1603117.	2152997.	0.744598	0.4721
R-squared	0.989105	Mean dependent var		20248586
Adjusted R-squared	0.986133	S.D. dependent var		12985410
S.E. of regression	1529137.	Akaike info criterion		31.54148
Sum squared resid	2.57E+13	Schwarz criterion		31.73030
Log likelihood	-232.5611	F-statistic		332.8646
Durbin-Watson stat	2.138304	Prob(F-statistic)		0.000000

Source: Authors' computation using eviews software