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The Impact of Telecommunication Expenditure on Economic Growth in Nigeria

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Abstract
This paper examined the impact of telecommunication expenditure on economic growth in Nigeria using time series data from 1970 to 2010. In conducting the analysis, the unit root tests and co-integration tests were estimated using the Augmented Dickey-Fuller technique. The estimated results show that telecommunication, Foreign Direct Investment (FDI) and the degree of trade openness have positive impact on economic growth in Nigeria while unemployment has negative impact. The unit root test shows that real GDP and the degree of trade openness are integrated of order one, I(1) while telecommunication is and the FDI are integrated of order zero.
Key words: Economic Growth, Telecommunication, unemployment and Trade openness, Nigeria

1. INTRODUCTION

The world has become a global village with telecommunication being an indispensable tool in the entire process of globalization. However, it is not in dispute that Telecommunication industries play essential roles in this process. This is obviously why development in this vital sector over the years has been phenomenal all over the world. In fact, this is why emerging trends in socio - economic growth shows high premium being placed on Information and Communication Technology (ICT), by nations, organizations and homes. Unlike in the past, governments consider telecommunications service to be so vital to national interest and economic development that it was placed directly under their control in most countries until fairly recently, when deregulation and competition were introduced (Lee, 2003).

The emergence of Telecommunication has brought a new era in communication industry. The internet, mobile phone and computer, have brought about a fundamental shift in patterns of communication and human relationships. Communication revolution has also brought about amazing social, economic, cultural and psychological transformation. It has reduced the globe into a village through reduction of time and space (Keil & Johnson, 2005, Offurum, 2009). These recent advances in telecommunications technology have been an important vehicle in permitting information exchange to develop as a valuable commodity for moving the country into post industrial and information based economic growth. In this present world, a modern telecommunication infrastructural development is not only essential for domestic economic growth, but is a prerequisite for participation in increasingly competitive world markets and for attracting new investments.

Nigeria today has not 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) licences 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).

Although a growing numbers of studies have attempted to identify telecommunication as an essential component of the economic infrastructure, fostering productivity and economic growth. This particular study seeks to identify the impact of Telecommunication on economic growth in Nigeria. Efficient flow of information reduces communication and transaction costs and accelerated information diffusion enhances market efficiency and competition as well as the potential for technological catch-up.

The Nigerian economy has been driven by gains made in the oil and gas sector. Although Nigeria has clearly made great gains from her abundance of oil, it is clear that oil is a non sustainable resource and in order to ensure effective industrialized economy, Nigeria must look away from her oil sector and consider the growth and gains that can be culled in her other sectors. The Telecommunications growth and explosion is a clear indication that there is much gain to be made outside the oil industry. In year 2007, the percentage share of telecommunications to GDP was 1.77.

From the above discussion, it is observed that the argument has not been rested. The questions that beckon answers from the above are:

1. What are the impacts of telecommunication on economic growth in Nigeria?
2. Does telecommunication have a short or long term relationship with economic growth in Nigeria?

Objectives of the Study

The objectives of the study include:

1. To identify the impact of telecommunication on economic growth in Nigeria.
2. To investigate whether there is a long run relationship between telecommunication and economic growth in Nigeria.

Literature Review

Two schools of thought explain the relationship between telecommunication and economic growth. These are the Technophiles and the Technophobic. The technophiles believes that telecommunication has a positive effect on growth. They argued that ICT will expand productivity, improve employment and upgrade the quality of work in many occupations. Moreover, ICT will offer many opportunities for small scale, independent and decentralized form of production (Posu 2006). The technophobia regards telecommunication as having a negative effect on economic growth and widening the information gap between the rich and the poor, the literate and the illiterate. While admitting that ICTs could have profound changes on a society, Van Dijk (1999) believes that applications of ICTs and their transformative nature have been greatly exaggerated. They may destroy more jobs than they create; the gap between the rich and the poor may widen. Mansell (1999) saw the huge capital investments required on ICTs as diverting resources from other sectors of the economy that could have greater growth impacts.

There are various economic theories that elaborates more on how technological advancement e.g. telecommunications can bring about economic growth. The Technology Determinism Theory (Smith & Marx, 1994), society's cultural values, social structure and history are all technology driven. The theory posits that, rather than social context shaping technology, the uses of technology determine the growth and development of the society. This implies that technology dictate users' behaviour and action (Green, 2001). The implications of this postulate; is that cell phones (technology) exert large influence on the behaviour of people including members of the family.

The modern conception of economic growth began with the critique of Mercantilism, especially by the physiocrats and with the Scottish Enlightenment thinkers such as David Hume and Adam Smith, and the foundation of the discipline of modern political economy. David Ricardo argued that trade was a benefit to a country, because if one could buy a good more cheaply from abroad, it meant that there was more profitable work to be done here. This theory of "comparative advantage" would be the central basis for arguments in favour of free trade as an essential component of growth. Because of diminishing returns to capital, economies will eventually reach a point at which any increase in capital will no longer create economic growth. This point is called a "steady state". The model also notes that countries can overcome this steady state and continue growing by inventing new technology. In the long run, output per capita depends on the rate of saving, but the rate of output growth should be equal for any saving rate. In this model, the process by which countries continue growing despite the diminishing returns is "exogenous" and represents the creation of new technology that allows production with fewer resources. Technology improves the steady state level of capital increases, and the country invests and grows.

New capacity is more efficient because of new technology, improved methods and economies of scale. This leads to further price reductions, which further increases demand, until markets become saturated due to diminishing marginal utility. The endogenous growth theory that includes a mathematical explanation of technological advancement incorporated a new concept of human capital, the skills and knowledge that make workers productive. Unlike physical capital, human capital has increasing rates of return. Research done in this area has focused on what increases human capital (e.g. education) or technological change (e.g. innovation).

The "Big Push" which suggested that countries needed to jump from one stage of development to another through a virtuous cycle, in which large investments in infrastructure and education coupled with private investments would move the economy to a more productive stage, breaking free from economic paradigms appropriate to a lower productivity stage. Schumpeterian growth model sees growth as a process of creative destruction, which captures the dual nature of technological progress In doing so, they make old technologies or products obsolete. This destruction is referred as the annulment of previous technologies which makes them obsolete. Theoretically, the aggregate improvement will translate into economic growth.

Madden and Savage (1998) analyzed the relationship between telecommunications infrastructure investment and economic growth by taking a sample of transitional economies in central and Eastern Europe.

The study shows mutual causality between telecommunication investment and real economic growth at the aggregate level.

Fewer studies on telecommunications infrastructure concentrate on reducing transaction cost, increasing TFP (Total Factor Productivity) of the private sector and diffusion of new technologies, which will remedy the problem of the developing countries Belaid (2002). According to Rodini et al (2003), Telecommunications has impact on Human and Social capital through history, theory and growth in the developing world in Development Economies. In recent years, there have been a large number of telephone demand studies that emphasized the substitution or complementary between fixed and mobile telephone services. While some of these studies find substitution between mobile phones and fixed phones systems using consumer phone data.

Ding and Haynes (2004) investigated the role of telecommunication infrastructure in long-run regional economic growth in China for sample of 29 regions. The study used a dynamic fixed effects model for estimation, which allows testing the relationship between regional economic growth with initial economic condition, fixed investment, population growth as well as telecommunications infrastructures. On the basis of this study, telecommunication is both statistically significant and positively correlated to regional economic growth in China.

Vagliasindi et al (2006); Minges (1999); Madden and Coble-Neal (1999); and Okada and Hatta (1999), found out that mobile phones and fixed phones are moderate substitutes and that the lower the penetration rates of fixed phones, the stronger the substitutability between fixed and mobile phones. Critical studies of the influence of telecommunication on various key countries show a positive relationship between telecommunication and economic growth (Jorgenson 2001, Kraemer and Dedrick 2001). Posu (2006) used data for the period 1999-2004 to identify the impact of telecommunication on Nigerian economic growth and discovered that about 77% variation in GDP during 1999-2004 is attributable to investment in telecommunication.

The Model

The model for the study is multiple regression model with Ordinary Least Square technique. In this model real Gross Domestic Product is influenced by telecommunication, unemployment, trade openness, foreign direct investment and electricity consumption. Thus the model is specified as:

Rgdp = f(tel, unemp, top, fdi, ec) ……..……..……..(1)

Transforming equation (1) into econometric form for estimation yields

$RGDP_t = \beta_0 + \beta_1 TEL_t + \beta_2 UNEMP_t + \beta_3 TOP_t + \beta_4 FDI_t + \beta_5 EC_t + \mu_1$…..(2)

Where

RGDP = Real Gross Domestic Product.
TEL = Telecommunications (expenditure)
UNEMP = Unemployment
TOP = Trade Openness
FDI = Foreign Direct Investment
EC = Electricity Consumption
t = Time from 1970-2010
β_0= Intercept Term.
B_i = the relative slope coefficients of the parameters.
μ_1 = Stochastic Error Terms

Results

The results of the multiple regression model with OLS technique are shown with the aid of table table 1.

Table 1: Results of the LogRGDP function

Variables	coefficients	Standard Errors	t-values
Log FDI	0.44608	0.0545979	8.17
EC	-0.23748	0.386099	-6.15
Unemp	-0.354124	0.248107	-1.43
Telcom	0.000188	0.0000408	4.6
TOP	-0.023877	0.0090248	2.65
Constant	11.53134	0.4861851	23.72

In the model, the coefficient of the constant is 11.53134 which shows the value of LOG(RGDP) even if the impact of all explanatory variables are individually zero. It has a positive sign implying that, if other variables are assumed constant, the rate of growth will be equal to 11.5%. A unit increase in FDI leads to 0.44608 increase in RGDP. In other words a percentage increase in FDI changes RGDP by 0.45%. A change in electricity consumption leads to decrease 23.7% decrease in Real GDP while unemployment and trade openness decrease

RGDP by 0.35% and 0.24% respectively. The results further shows that all the explanatory variables are statistically significant except unemployment rate. The coefficient of determination (R^2) shows that the exogenous variables in the model explain up to 88% of the total variations in RGDP.

Conclusion

Economic growth in Nigeria is principally a function of variation in some macroeconomic fundamentals. There is need for a macroeconomic environment that will encourage telecommunication industry and foreign direct investment in order to enhance growth in Nigeria. The use of mobile phones in Nigeria has become very useful for individuals and industries in both the urban and rural areas. There is no doubt that the output of industries has increase and the life of many Nigerians improved within the era of improvement in telecommunication industry.

The consumption of electricity in Nigerian, unemployment and the degree of trade openness have negative relationship with economic growth. The demand side of electricity is determined by the amount of energy supplied by the Power Holdings Company of Nigeria (PHCN). There is need for proper investigation on energy consumption in Nigeria as the supplier has failed the consumers. This is why we have contrary result to a priori expectation of the parameter for electricity consumption. On the side of the degree of trade openness, Nigeria is still a developing nation that needs a mild check on the nature of openness which her infant industries face. There is need to checkmate the trend of unemployment as it impacts negatively on economic growth in Nigeria. Telecommunications can aid sustainable economic development when used appropriately, with the full participation of all stakeholders in the developing economies. The intrinsic value of telecommunications does not lie in easing communications and information, but in enabling growth and development. In a country like Nigeria, where a vast section of the population is below the poverty line, telecommunications offer a chance to empower the residents and transform them into more productive human capital.

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Notes

Note 1. This is an example.

Note 2. This is an example for note 2

Table 1. The capitals, assets and revenue in listed banks

	Total capital stock	Income of main business	Total assets
Pudong Development Bank	39.2	214.7	5730.7
Bank of China	459.4	3345.7	59876.9

Description for the above table.

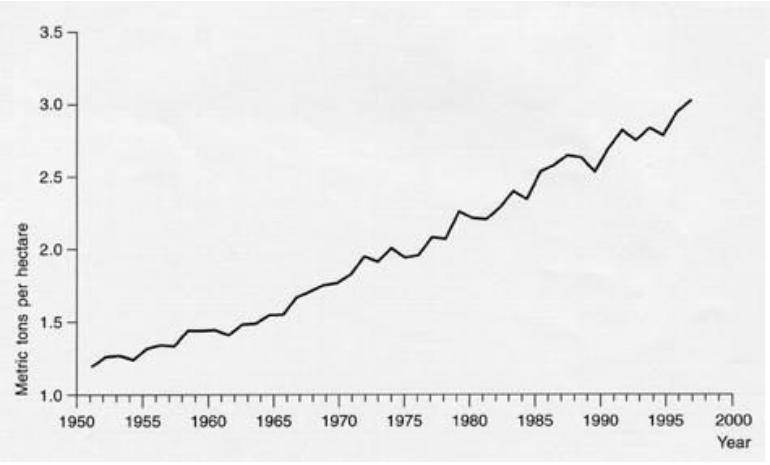

Figure 1. The Trend of Economic Development

Description for the above figure.