GSM COVERAGE IN NIGERIA AND ITS IMPACT ON THE ECONOMIC WELFARE OF CITIZENS

BY

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(M.Sc/Soc-Sci./05343/2008-2009)

DEPARTMENT OF ECONOMICS

AHMADU BELLO UNIVERSITY, ZARIA

NOVEMBER, 2012

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NIGERIA

NOVEMBER, 2012

DECLARATION

I hereby declare that this thesis titled, "GSM Coverage in Nigeria and its Impact on the Economic Welfare of Citizens"has been written by me and the research work is original. All borrowed ideas have been duly acknowledged by means of references and I remain solely responsible for whatever deficiencies associated with this work.

Abu Elias …… ……

Signature Date

CERTIFICATION

This thesis titled "GSM Coverage in Nigeria and its Impact on the Economic Welfare of Citizens" meets the regulations governing the award of M.Sc. in Economics, Ahmadu Bello University Zaria and is approved for its contributions to scientific knowledge and literary presentation.

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DEDICATION

This piece of work is dedicated to God for seeing me through this program. Also, to the entire members of my family, especially to the memory of my late mother, Mrs. Martina Augustine. May her gentle soul rest in peace… Amen.

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ABSTARCT

This study investigated the impact of GSM Coverage in Nigeria on the economic welfare of citizens.The study used both primary and secondary data. The primary data was obtained through 200 questionnaires issues to GSM mobile line subscribers in Abuja, comprising subscribers of MTN, Airtel, Globacom and Etisalat randomly selected from Kubwa , Dutse , Lugbe, Kuje, Gwagwalada, Gwarinpa, Wuse and Central Area, all within Abuja the Federal Capital Territory through the use of random sampling . The data were analyzed using both regression analysis and chi square techniques in addition to descriptive tools such as tables and simple percentages. The study established that a positive and significant relationship exists between GSM Mobile Lines Teledensity (GMLTD) and the Economic Welfare of Citizens (EW). The studies also identified some of the challenges facing GSM subscribers in Nigeria. The study also observed that poor service delivery and inefficiency in mobile communication have acted as a significant impediment to the potentially greater contribution of the sector to economic growth. The study therefore recommends that the National Communication Commission should enhance its regulatory efforts especially in the area of service delivery.

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CHAPTER ONE

1.1 BACKGROUND OF THE STUDY

The growth of technology across the world in recent time cannot be over emphasized. Globalization and technology has indeed made the world a small village. Awake Magazine (2009), believes that technology has found its way into every corner of the world, even crossing the divide between the rich and poor and has become a part of life for many, if not all. The pervasiveness of technology is perhaps most apparent in the proliferation of The Global System of Mobile Communication (GSM) and cell phones.

The Global System of Mobile Communication (GSM) was approved in Nigeria on the 27th of August in the year 2000, as part of the economic liberalization that started in 1986, with the Structural Adjustment Programme (SAP). GSM is a vital economic infrastructure in the so-called New Economy. Such economic infrastructure is necessary for modern growth and development. It can deliver major benefits to economic growth, poverty alleviation, improved welfare and environmental sustainability if it provides services that respond to effective demand and does so efficiently.

A significant proportion of both foreign and domestic investments has been channeled to this area of infrastructure in the past, but in many cases these assets are not generating the desired quantity and quality of service demanded (World Development Report, 1994). The resources expended on GSM services may constitute a potential loss to subscribers in terms of forgone economic growth, lost opportunity for poverty reduction and improved welfare if the satisfaction derived is less than the resources spent on the services.

World Development Report (1994), also, suggested that the provision of infrastructure should be seen and treated as a service industry that responds to consumers demand. But, somehow in Nigeria, there is no bottom line yardstick to measure customers or consumers satisfaction. As a result of this situation, individuals and corporate business entities may not be deriving equivalent value for money or resources spent on GSM services. Also, the report postulated that the causes of poor performance and the source of improved performance lie in the incentives facing providers of infrastructure. Again, it emphasized that to ensure efficient and responsive delivery of infrastructural services, incentives need to be changed through the application of instruments such as commercial management, stakeholders' involvement and competition. In addition, government should genuinely be responsible for creating policy and regulatory framework that will safeguard the interest of the masses, improve economic welfare as well as environmental conditions. These are rational recommendations that are likely to bring about progress, growth and development if properly implemented.

1.2 STATEMENT OF THE PROBLEM

As at August 2010, Nigeria telephone density is estimated at around 58 telephones for about 100 people or 58.52 per cent (NCC, 2010), as against a teledensity of about 0.5 telephone lines per 1,000 people in the 1990s. Statistically, there has been a tremendous growth in terms of GSM mobile line expansion. Between August 2000 and August 2010, the total subscriber base for connected mobile lines has grown from 35,000 lines to above 78 million lines (NCC, 2010), However, it is not all about increase in the demand for new lines that matters; there is also the desire for good quality services from the operators

The second empirical issue is the quality of services provided by the GSM operators. These issues are likely to have significant bearing on the quality of service and its potential contribution to growth and welfare.

Some of the complaints consumers make includes exorbitant charges, drop balance, drop calls, Internet issues, voice clarity, one way speech, poor network availability and connectivity issues, pending and undelivered Short Message Service (SMS), access to customer care unit, pending and unloadable recharge issues and failed promises.

The above items shall be discussed in full details in chapter two of this work. In fact, the extent to which these issues constitute a potential limit to the GSM's contributions is summarised in the nature of the complaints by consumers of GSM services as of 2007 (Umenyi, 2008). Out of the total complaints, the highest, 45% is from MTN subscribers and the least 1% is from Starcomms subscribers (appendix A).

Finally, the study intends to explore the possibility of improving GSM service in Nigeria given the above consumers' complaints and other shortcomings that may be identified in the course of this study.

Eleven years after the introduction of GSM in Nigeria, subscribers are still experiencing drop calls, drop balance, high tariff, undelivered text messages, network failures and other failures. All these are potential avenues which may undermine subscribers' satisfaction. These inefficiencies potentially set limits to the extent of welfare improvement that the GSM service can cause. Therefore, there is a potential regulatory as well as policy issue involved.

1.3 RESEARCH QUESTIONS

The research questions of this study include:

i. What is the impact of the growth of GSM lines on the economic welfare of the citizens in Nigeria?
ii. Are the GSM mobile subscribers comfortable with the level of service delivery in Nigeria by the GSM service providers?
iii. What can be done to improve GSM service in Nigeria?

1.4 OBJECTIVES OF THE STUDY

The main objective of this study is to:

i. Examine the impact of the growth of GSM lines on the economic welfare of the citizens in Nigeria.
ii. Highlight the opinions of GSM mobile subscribers and identify the shortcomings of GSM service delivery in Nigeria.
iii. Lastly, make recommendations on how GSM service delivery can be improved in Nigeria.

It is in the light of the rapid spread and growth of GSM services across Nigeria from 1970 to 2010, with anecdotal evidence suggesting a disproportionate value in consumers' satisfaction that this study intends to evaluate the service delivery of the GSM Operators across Nigeria. Also, the study intends to evaluate the impact of GSM in Nigeria on the economic welfare of the citizens. Hence, this work set out to examine the impact of GSM on economic welfare as well as service delivery issues.

1.5 STATEMENT OF HYPOTHESES

The central hypothesis of this work, are as follows:

Hypothesis One:

H_0: GSM services have no impact on economic welfare of Nigerians.

H_1: GSM services have impact on economic welfare of Nigerians.

Hypothesis Two:

H_0: GSM service delivery is poor and inefficient in Nigeria

H_1: GSM service delivery is good and efficient in Nigeria.

1.6 JUSTIFICATION OF THE STUDY

It is almost eleven years since GSM technology was introduced in Nigeria. It is actually a good thing that it came. But ever since its emergence, Nigeria in general and subscribers in particular have experienced issues of high tariff, undelivered SMS, one way speech, voice clarity, network issues, recharge issues etc. So far, many related empirical works has been done but with particular reference to traditional landlines and cellular phones. However, this work is with specific reference to GSM mobile lines and wish to establish whether the potential positive effects of GSM service on welfare is greater than the potential negative effects of some of its inefficiencies on welfare. The study will empirically eqstablish whether the overall benefit of GSM mobile lines in Nigeria to the general welfare of citizens is actually positive or negative, because it is not all about deriving satisfaction, rather it is about deriving optimal satisfaction giving the available resources.

Secondly, the study may serve as a guide or medium of feedback to GSM operators, regulators and potential investors. It may prompt operators to improve service delivery based on the identified failures and shortcomings on their part**.** If that is done, it will go a long way to improve operators' friendliness and sensitivity towards existing and potential GSM subscribers. Also, potential investors may identify consumers' needs and aspirations, and take advantage of the situation. Lastly, it may equally serve as a reference for the GSM regulators to evaluate the extent to which GSM services are impacting on national welfare. This may enable the regulators to make better policies that will ensure that consumers' welfare or satisfaction is maximised.

Lastly, the GSM subsector of the communication sector is consistently and continuously gaining ground in the Nigerian economy. It is an important sector to reckon with. NCC (2005) reported that private investment into the Nigerian telecoms sector (courtesy of GSM subsector) has grown to over US$6 billion, from US$50 million in 2001, and as at late 2010 it is over US$9.5 billion with the sector now the largest generator of Foreign Direct Investment (FDI), after the Oil and Gas sector. Not much empirical study has been done, especially in the light of Nigerian economy. This is because it is an emerging subsector which came into existence less than 11 years ago. This study will serve as a guide for further study on this subject matter. Besides, it will add marginally to the existing empirical literatures as well.

1.7 SCOPE OF THE STUDY

Telephone lines are categorised into three main groups, which include:

A. Fixed Wired or Wireless Lines

B. Code Division Multiple Access (CDMA) Mobile Lines, and

C. Global System of Mobile Communication (GSM) Mobile Lines

This study is specifically concerned with GSM lines. The economic welfare of citizens shall be measured via the national per capita income (PCI). That is, PCI will stand as an index for measuring economic welfare of citizens. The PCI is expressed as the ratio of Gross Domestic Product (GDP) to Population. The study shall use a sample size of 40 years which would cover the period of 1970 to 2010. The primary data for this study would be obtained randomly from GSM mobile subscribers in Abuja, Nigeria (consisting of operating networks such as Mtn, Zain, Globacom and Etisalat.) using questionnaires with a sample size of 200 subscribers. The secondary data, on the other hand, was obtained from the Nigerian Communication Commission's Annual Reports (Various Years), Central Bank of Nigeria's Annual Reports, CBN Statistical Bulletins, National Population Commission Annual Reports, National Bureau of Statistics Annual Reports Newspaper and Magazines and other important websites.

1.8 ORGANISATION OF THE STUDY

The study shall be organised into five chapters. Chapter one presents the Background of the study, problem statements, research questions, objectives, statement of hypotheses, justifications, and the scope of the study. Chapter two presents the review of various literatures. More so, chapter three dwells on the Methodology of the study, while chapter four deals with data presentation and analysis. Finally, Chapter five concentrates on summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 THE ROLE OF GSM AND INFOMATION TECHNOLOGY ON ECONOMIC GROWTH

The Nigerian Telecommunication sector is an emerging subsector of the Nigerian economy. GSM mobile service in Nigeria is a very crucial element to this study. The emergence of the so called New Economy and the information and communication technology (ICT) is transforming the global economy. Ehrlich (2006) explained that the mobile phone is the most widely used form of telecommunication in the world and has become a major engine of development. According to the study, Mobile communications boost the earnings of many users, change the local economy and even significantly raise the GDP of many countries. There are examples of business people everywhere in the world using mobile phones to boost their income significantly.

A recent study by the international consultancy McKinsey (2010) found that the mobile industry accounts for as much as eight per cent of GDP in China, India and the Philippines. ICT in general and GSM in particular have provided easy access to the many new services, such as job information, e-government, telemedicine, entertainment and news. GSM services can provide people with valuable information that boosts their personal and economic welfare (Aker et al. 2010). For example, a telephone call, email or Internet search could save people from making long journeys to contact relatives, search for employment.

The cellular network is also used to meet demand for sophisticated services in the rural areas such as to find out which market is offering the best prices for farmers crops (Aker et al., 2010). In summary, GSM has greatly brought convenience to many people. Global ICT report (2006) opined that GSM has a vast potential to bring about social and economic progress. This in line with the conclusion of a study by Aker et al. (2010) which arrived at finding that Mobile phone usage in Sub-Saharan Africa has grown significantly over the past decade and now covers 60 percent of the population. Empirical evidence according to the study shows that mobile phones have the potential to benefit consumer and producer welfare, and perhaps broaden economic development.

Besides, the Indian industry exported software and services worth 25 million dollars in 1985, and between 2000 and 2004 the figure had grown to $12.8 billion (NASSCOM, 2005) and is expected to reach $50 billion in exports by 2008. As at 2004, ICT accounts for 2 percent of India's gross domestic product (GDP) and 14 percent of the exports and is expected to account for 8 percent of the GDP, a total employment for four million people in 2008 (The Hindu –Survey of Indian Industry, 2004).

Again, ICT has attracted a lot of Foreign Direct Investment (FDI) to many countries. Some empirical studies believe that the determinants of FDI include natural resources, market size, socio-political instability, business operating conditions, wage costs, exchange rate, trade barriers, export orientation, openness of developing host countries, democratization and risk, infrastructure, human capital and political instability. But, today ICT is seen as the main new determinant of FDI (Addison and Heshmati, 2004). The world is rapidly moving toward an economic system based on the continuous and pervasive availability of information. Recent advances in ICT

have been an important vehicle in permitting information exchange to develop as a valuable commodity. Countries and sectors equipped with the requisite telecommunications systems have been rapidly moving into post-industrial, growth orientated information based economy and Nigeria cannot be left out.

The Nigerian telecom sector cannot be left out as it has become an attractive revenue source to Federal Government of Nigeria. According to NCC (2005), the Federal government has earned over $2.5 Billion US Dollars from Spectrum licensing fees alone between 2001 and 2010. Besides, import duties and taxes from the telecom industry have also contributed substantial revenue to the Federal Government. Prior to 2001, the level of investment in the telecommunications sector was less than US$100 million. Eleven years after the introduction of GSM, the growth of the telecommunications sector is phenomenal. NCC, (2005) reported that private investment into the Nigerian telecoms sector has grown to over US$6 billion, from US$50 million in 2001, with the sector now the largest generator of Foreign Direct Investment (FDI), after the Oil and gas sector. The investment in this sector as at date is over 9.5 billion US Dollars. A substantial part of which are FDI. Nigeria has thus become one of the most desired investment destinations for ICT in Africa, (James, 2002).

The ICT sector can be an important source of continuous growth and revenue for Nigeria. The global as well as domestic demand for these products and services is growing by the day. The growth of the sector is likely to have a positive bearing on economic growth in general.

James (2002) also agrees that Information and Communication Technologies is a vital ingredient for development which requires government support to optimally utilise its potential. He advised that programmes that will encourage result-oriented

development in the sector should be put in place. Blomström, Globerman and Kokko (2000) opined that there exists causality between ICT and FDI, and that liberalization, in particular, is normally expected to increase FDI. Seo and Lee, (2000) in Asia, did a study on Korea and their finding showed a significant contribution from ICT investment while another study by the Australia National Office of Information in 2003, also confirmed that ICT and services have become pervasive and general-purpose enablers of economic and social transformation. They concluded that given the enabling socio-economic environment, ICT would provide the platforms on which the growth in productivity, innovation and social well-being can be constructed. A study by Kraemer and Dedrick (1994) using 12 Asia-Pacific countries and data from 1984 to 1990, established that IT investment is positively related with gross domestic product (GDP) and productivity growth. Dewan and Kraemer (1998 and 2000), are studies that have equally confirmed the relationship between ICT and economic growth. Again, Kraemer and Dedrick (1994) established that there is a significant relationship between ICT investment and productivity growth using the data from 12 Asia Pacific countries. Furthermore, Pohjola (2000, 2002) performed a cross-country studies with the data from 39 and 42 countries for the periods of 1980-1995 and 1985-1999 respectively and came up with a similar conclusion as Kraemer and Dedrick (1994) that ICT plays a significant role in economic growth in developed countries but not so in developing countries. Again, Dewan and Kraemer (1998) with data set from 1985-1993 for 36 countries concluded that ICT investment is positive for developed countries but not significant for developing nations. However, in a single country studies, Kraemer and Tallon (1999) on Ireland; Oliner and Sichel (2000), and Jorgenson and Stirch (2000) on USA; Kraemer and Dedrick (2001)'s study of

Singapore; and Joseph (2002) on India, showed that ICT contributed to economic growth.

According to a market research by a website, (reportlinker.com) it was published that, "The Nigerian government has realized the importance of ICT as a viable platform to transform the country's economy into knowledge-based economy. The deregulation of telecommunication services in Nigeria actually began in 1992 with the promulgation of Nigerian Communication Commission (NCC) which licensed private participation in the provision of telecommunication services in Nigeria, thus ending the state-owned NITEL's monopoly of the sector and ushering in competition (Tella et al. 2007). Today, the Nigerian telecom sector is presently undergoing speedy transformation— courtesy of the GSM subsector.

Roller, (2001) and Lamont, (2001) have successfully measured the growth dividend of investment in telecommunication infrastructure in developed economies. ICT sectors may have the mysterious impact of the invisible hand by way of technology transfer, training of personnel and export growth and the inflow foreign capital and advertising to potential investors and that ICT sector in Nigeria is economically viable. Similarly, many commentators are of the opinion that deregulation of telecommunication sectors promotes more investment, improves telecommunication capabilities, increases foreign investment, creates boom in private sector development, creates more employment opportunities and better education and training facilities. Bayes *et. al.* (1999) found that 50 per cent of all telephone calls are usually for economic purposes such as employment opportunities, prices of goods and services, land transactions, remittances and other business issues. A considerable number of studies have identified telecommunications as a vital economic infrastructure, which promotes productivity and economic growth.

Telecommunications infrastructure has both direct and indirect benefits to economic growth (Cronin et. al., 1993b). Roller and Waverman (2001) endogenized telecommunication infrastructure into aggregate economic activity. They initially specified a micro model of the demand for and supply of telecommunication infrastructure, and collectively estimated the micro model with the macro production function and concluded that a significant causal relationship exists between telecommunications infrastructure and aggregate output. Again, in another study Datta and Agarwal (2004) extended the cross-country growth framework of Barro (1991) and Levine and Renelt (1992) 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.

Many empirical studies and growth literature have been developed over the years, which regressed growth in real per capita GDP on its initial level and a wide variety of control variables of interest within these literature. Most of the studies arrived at the conclusion that various measures of technology or telecommunication related variables have a significant positive correlations with economic growth and with the assumption of ceteris paribus, (that is, all things being equal). These researches have been very important in regards to the consensus among many economists that "ICT promotes growth".

2.2 DEFINITION OF CHALLENGES FACING SUBSCRIBERS IN NIGERIA

The conceptual review for this study is based on the definitions of major concepts in this research work.

Exorbitant Charges. According to Anyawu, (2007), the average tariff rate per seconds or minutes call in Nigeria is quite on the high side. When GSM was first introduced in Nigeria in 2000, it was purely a "***per minute billing***" (i.e. 50 Naira per Minute). However, the tariff rate for calls has dropped drastically dropped due to competition which emanated as a result of deregulation of the Telecom sector. Yet, Nigeria still ranked among the countries that have the most expensive tariff rate per minute call in the world. Opara (2007) categorically stated that "GSM tariff in Nigeria is the highest in the world". It is quite pathetic that Nigerians are still paying heavily for calls despite the fact that most of the existing GSM operators have recoupedback their initial cost of operation.

Drop Balance. Most GSM subscribers confronted with the challenges of unlawful deductions of airtime from their credit account without receiving proportionate value in return for the deduction. This sudden deduction is what is termed a ***Drop balance,*** (Ariwodo, 2007).

Drop Calls. This refers to the sudden termination of call without subscribers consent. This is usually as a result of network deficiencies. (Ariwodo, 2007).

Voice Clarity. This is a situation where calling parties either the initiator, the receiver of a call or both parties experience poor call clarity. That is, either the caller or the receiver fails to get the message which the other party wishes to pass across, not as a result of understanding on the part of the calling parties, but a result of network deficiency which prevents one or both parties from getting the verbal message clearly, and yet are billed for the calls (Guardian 2007).

One way Speech. This is a situation in which only one party, either the caller or the receiver in a call process can hear the other party clearly. These situations deny

subscribers value for their hard earned money since they are billed for such calls and yet they do not derive the expected value for such service (Opara, 2007).

Poor Network Availability and Connectivity Issues. One of the fundamental reasons for GSM evolution is for subscribers to be able to make and receive calls when the need arises. But, according to (Guardian, 2008), most Nigerian finds it difficult to enjoy this fundamental benefit of GSM services due to poor network. The absence of sufficient network or strong network capacity makes it extremely difficult to make calls even with sufficient airtime on one's line or receive calls with line functionally active.

Pending and undelivered Short Message Service (SMS). There are times when subscribers send SMS and the status of the SMS will remain pending for a long time and sometimes undelivered yet subscribers are billed for such messages. Ariwodo, (2007), mentioned delayed or missing text messages as one of the problem of GSM in Nigeria. Punch (2007), shares the same opinion.

Access to customer care unit. The role of customer care unit in any organisation is very crucial to the effective and efficient delivery of customers' satisfaction. This unit helps in the area of educating customers about existing and new products, informing customers about current happenings and in resolving customers' issues with products and services whenever the need arises. But, according to (Umenyi, 2008), the situation in Nigeria is a total deviation from the normal. Given this situation, potential customers are most likely to be stranded. Again, Guardian (2007) mentioned that the customer care personnel of GSM providers are not responsive to consumers' plights.

These are some of the issues subscribers of GSM operators experience on daily basis. If these issues can be minimised it will go a long way in increasing the satisfaction of GSM subscribers.

2.3 Concept of GSM

GSM stands for Global System for Mobile Communication. It is a special technology that enables telephone subscribers or users to make, receive and enjoy other subscribed services such as Internet, data and Short (alphanumeric) Messages Services, known as SMS while on transit or on the move. According to Scourias (1995), the evolution of GSM was triggered by the rapid growth experienced by analogue cellular telephone system in Europe during the early 1980s particularly in the Scandinavia, United Kingdom, France and Germany. In 1982, the Conference of European Posts and Telegraphs (CEPT) formed a study group called Group Special Mobile (GSM) to study and develop a Pan-European public land mobile system (Rahnema, 1993). The proposed system was commissioned to meet stipulated quality standard such as good subjective speech quality, low terminal and service cost, support for international roaming and support for range of new services and facilities.

In 1989, the responsibility of GSM was transferred to the European mobile Telecommunication Standard Institute (ETSI), and in 1990, the phase 1 of the GSM specification was published. In mid-1991, commercial service had started and by 1993, there were 36 GSM networks in 22 countries with 25 additional countries having already selected or were considering GSM. As at early 1995, there were over 5 million subscribers. Today, GSM subscribers are in billions. ***The acronym for GSM now aptly stands for Global System for Mobile Communication,*** (John Scourias, 1995). Over the years there have been continuous improvements in GSM services.

Besides, many additional supplementary services have been added to GSM operations.

2.4 Concept of Economic Welfare

The term 'Welfare' has been interpreted differently from different perspectives by different groups, individuals and scholars. Encarta Encyclopaedias (2005) sees it as a 'Social Security Programmes'. Grossman (1994) and Newman et al. (1994) viewed it as a 'social program' and 'social sector programs' respectively. The main essence of governance is to promote and protect the welfare of its citizens. The 1999 Constitution of the Federal Republic of Nigeria, in its provisions supported this position. Section 14, sub section 2(b) makes it categorically clear on the relationship between "The Government and The People" that borders on development by stating that, "the security and welfare of the people shall be the primary purpose of government".

In a simple language, economic welfare refers to the overall economic well-being of a person or group of persons that share common characteristics. The economic well-being of an individual is as important as that of a nation, because it is the individual component that sums up to form the national entity. Economic welfare has to do with the ability of individuals or group of individuals within a single entity to enjoy the maximum benefit obtainable within the confine of their available economic resources.

According to Nordaus and Tobin (1972), welfare depends on the amount of total satisfaction one receives from total consumption. They viewed economic welfare in the light of Gross National Product (GNP). They used GNP as a proxy for measuring economic welfare. However, this study, shall view welfare in terms of a general economic and social improvement in the lives of citizens.

2.5 Concept of Gross Domestic Product (GDP)

GDP is the most commonly used as a measure of an economy's output. It usually measures how much an economy produces within a given period. GDP can be referred to as the total market value of all final goods and services produced in a country during a given period which is usually one calendar year. The market value provides a convenient way to add together or aggregate the many different goods and services produced in an economy. However, the shortcoming associated with the calculation is that it is not all economically valuable goods and services that are bought and sold in the market. For instance, a typical example is the unpaid work of a housewife. Although, it is economically valuable but not sold in the market and so not included in the GDP accounting. But child care services or paid housekeeping which is sold in the market counts (Frank and Benanke, 2001: 105 - 110). Also, Amacher (1986) defined GDP as the sum total of all final products produced in a country in a year. However, the main idea behind the concept of GDP is that it takes into cognizance only the final goods and services produced in order to prevent the issue of double counting or over estimation of the GDP.

2.6 Concept of Economic Growth

Growth is a quantitative rise in the Gross National Product (GNP). In economic term, it means the capacity of a national economy to generate and sustain an annual increase in its GNP. Lipsey and Chrystal (2007), postulate that even small difference in growth rate can lead to big difference in living standards between generations. Economic growth according to Samuelson and Nordhaus (2001) represent the expansion of a country's potential GDP or national output. Put differently, economic growth occurs

when a country's Production Possibility Frontier (PPF) shifts outward. A closely related concept is the growth rate of output per person. This determines the rate at which a country's living standard is rising. By standard of living, we mean the degree to which people have access to goods and services that makes their lives easier, healthier, safer and more enjoyable. People with higher living standard tend to enjoy more and better consumer goods and services. They also view economic growth as a process of steady increase in the quality and quantity of goods and services an economy can produce. Although, not everyone in a society can share in the fruit of economic growth. Samuelson and Nordhaus, (2001) opined that there are four main factors that influence economic growth. These factors of economic growth are:

I. Human resources (labour supply, education, discipline, motivation)
II. Natural resources (land, minerals, fuel, environmental quality)
III. Capital formation(machines, factories, roads)
IV. Technology (science, engineering, management and entrepreneurship).

All the above mentioned factors are critical to economic growth. Technological advancement which is the last is equally a vital ingredient in the rapid growth of living standards in modern time. Technological change denotes changes in the process of production or introduction of new services. The radio, telephone, airplane and computer are all products of technological advancement.

2.7 GSM Architecture and Equipments

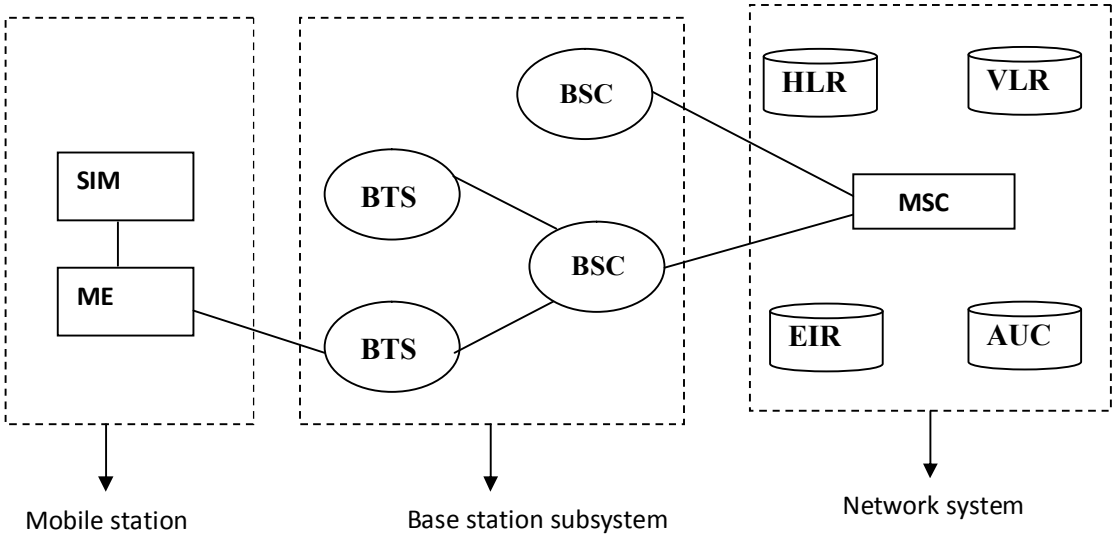
GSM network is comprised of several functional components with each component playing a specified role in the process of connecting two or more subscribers. This process requires an interaction between the various network elements (Scourias, 1995). Even though the process takes milliseconds, each element must perform a task

before an initiated call can be connected from the caller to the receiver. The GSM network can be divided into three main parts namely: Mobile Station, Base Station Subsystem and Network Subsystem. There are so many technical jargons involved. These include Subscribers Identification Module (SIM), Mobile Equipment (ME), Base Transceiver Station (BTS), Base Station Controller (BSC), Mobile Service Switching Centre (MSC), Home Location Register (HLR), Visitor Location Register (VLR), Equipment Identification Register (EIR) and Authentication Centre (AuC).

Due to the technicalities associated with GSM technology and given the nature of this research work we shall not be able to go into full details of GSM technology. However, below is a pictorial diagram of the technicalities associated with GSM technology.

Figure 1: A schematic diagram showing the GSM Architecture and Equipment

(Source: Scourias, 1995)



Subscribers Identification Module (SIM), Mobile Equipment (ME), Base Transceiver Station (BTS), Base Station Controller (BSC), Mobile Service Switching Centre (MSC), Home Location Register (HLR), Visitor Location Register (VLR), Equipment Identification Register (EIR) and Authentication Centre (AuC).

2.8 THEORETICAL REVIEW

2.8.1 Theories of Economic Growth

According to Lipsey and Chrystal (2007), economic growth theories study the determinants of the long run trend in GDP. It is also the economy's most powerful engine for generating long term increases in living standards. Most scholars, if not all are in favor of economic growth. But there seems to be disagreement about the best way to accomplish this goal. Some advocates for measures to stimulate research, development and technological change. Others advocate for a better educated workforce. Economists have over the years studied the relative importance of the different factors that stimulate economic growth (Samuelson and Nordhaus, 2001). There exists many theories of growth, but for the purpose of this study, we shall review three main theories of growth.

Classical Growth Theory

The modern conception of economic growth began with the critique of Mercantilism, especially by the physiocrats and with enlightened thinkers such as Thomas R Malthus, David Hume, David Ricardo and Adam Smith. They emphasized the critical role of land in economic growth (Samuelson and Nordhaus, 2001). The theory of the physiocrats was that productive capacity, itself, allowed for growth and increasing capital. Meanwhile, they stressed the importance of agriculture and saw urban industry as "sterile", Adam Smith (1976) extended the notion that manufacturing was central to the entire economy in his book titled, **"the wealth of nations"** in 1776. He started with a hypothetical idyllic age, which precedes both the appropriation of land and the accumulation of capital stock (Samuelson and Nordhaus, 2001). This theory has its weakness in its failure to recognize the role of technology in the development

of economies. However, it has helped to set a path to the development of growth theories.

Neoclassical Growth Model

The notion of growth as increased stocks of capital goods was codified as the Solow-Swan Growth Model, which involved equations which showed the relationship between labour-time, capital goods, output, and investment (Parkin, et al., 2005). According to this growth model, the role of technological change became very important, even more crucial than the accumulation of capital (Lipsey and Chrystal, 2007). This model, developed by Robert Solow and Trevor Swan in the 1950s, was the first attempt to model long-run growth analytically (Samuelson and Nordhaus, 2001). This model assumes that countries use their resources efficiently and that there are diminishing returns to capital and labour increases. From these two assumptions, the neoclassical model makes three important predictions that:

a. Increasing capital relative to labour creates economic growth.
b. Poor countries with less capital per person will grow faster.
c. And that because of diminishing returns to capital, economies will eventually reach a point (steady state) at which any increase in capital will no longer create economic growth.

This theory also notes that countries can overcome this steady state and continue growing by inventing new technology (Parkin, et al., 2005). 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. With consistent advancement in technological growth the idea of the steady state is completely unrealistic. This theory has made a landmark contribution to the

subject of growth models. However, weakness of the theory is with the assumption about the steady state.

Endogenous growth theory

Paul Romer and Robert Lucas, Jr. in the late 1980s and early 1990s developed a new growth theory. It was developed in response to the neoclassical economic growth model. Unsatisfied with Solow's explanation, they attempted to "endogenize" technology in the 1980s (Samuelson and Nordhaus, 2001). They developed the endogenous growth theory that includes a mathematical explanation of technological advancement. This model also introduced a new concept of human capital, the skills and knowledge that make workers more productive. Unlike physical capital, human capital has increasing rates of return. They argued that generally, there are constant returns to capital, and that economies never get to the stage of a steady state. They opined that growth does not slow as capital accumulates, but the rate of growth depends on the types of capital a country invests in (Lipsey and Chrystal, 2007). According to them, research done in this area has focused on what increases human capital or technological change. This growth model has equally added marginally to the theories of growth, but one of its weaknesses lies in its inability to explain key empirical regularities in the growth processes of individual economies and the world economy as a whole.

Despite the shortcomings of these growth models, they are still very relevant in the promotion of economic growth and development of world economies. Technological change and advancement is very critical to economic growth. Also, the application of the right technology at the right time is even more important to economic growth of nations.

The theoretical basis or framework for this study shall be the endogenous growth theory propounded by Paul Romer and Robert Lucas, Jr. in the late 1980s and early 1990s. This growth theory critically emphasized the role of technology in the growth and development of nations and country in general. It is obvious that GSM mobile lines are forms of technology and at the same time critical variables in this research.

2.9 The Nigerian Telecommunication Sector

Telecommunication facilities, was first established in Nigeria by the colonial administration in 1886 (Tella et al., 2007). Over the years, there has been a very little progress in the telecom sector until the liberalisation of the sector in the year 2000. In 1960, Nigeria had a teledensity of about 0.5 telephone lines per 1,000 people, (Ndukwe, 2004). The installed switching capacity as at the end of 1985 was about 200,000 lines. Telephone penetration remained poor, and was well below the target recommended by the International Telecommunication Union (ITU) for developing countries (Ndukwe, 2004).

As at December 1986, the total number of subscribers to telephone lines was about 230,000. In 1996, the network capacity of NITEL increased to 1,000,000 subscribers (Alabi, 1996).

Also, the emergence of Multilinks, EMIS and Inter Cellular between 1997 and 1999 must be acknowledged as a significant step in the advancement and expansion of telecom coverage in Nigeria (James, 2002). The enthronement of democracy in 1999 with policy thrust to fully liberalize the industry, brought about the liberalisation of the telecommunication sector. A New telecom policy was released in the year 2000, which became the hallmark on which the foundation for full liberalization of the telecom industry was laid. The major breakthrough in the communication sector in

general and the telecom subsector in particular was achieved in January 2001, when the sector was totally liberalized with the licensing of ECONET and MTN, which injected over 1.1million lines into Nigeria within a space of 12months, [Ndukwe, (2004)]. Over the years, this sector has witnessed a tremendous shift in progress as well as a geometrical advancement in coverage within a short period of 11years. Within this period, GSM mobile increased from 35,000 to above 65 million lines (NCC, 2010). GSM is spreading in a highly competitive manner from State to State, city to city, local government to local government and down to interior rural areas.

As at 2002, MTN, AIRTEL (formerly Zain Nigeria), GLOMOBILE and MTEL GSM dominated the GSM sector (James, 2002). However, in recent time, ETISALAT other Code Division Multiple Access (CDMA) Mobile networks such as Visafone, Starcomms, and Multilink have equally joined the competition. The majority of the Nigerian masses today can now access GSM services. Before this time, there were acute deficiencies in terms of telecommunication access in Nigeria. This is because most of the existing telephone service providers restricted their operations to Lagos (James, 2002). Besides, Nitel had some degree of technical monopoly power over telecommunication services. Therefore, competition was so little or none existing.

2.10 EMPIRICAL LITERATURE REVIEW

Tella et al. (2007) investigated the simultaneous relationship between telecommunications and economic growth in Nigeria. A system of equations that endogenize economic growth and telecom penetration as well as telecom investment was estimated. The study adapted the methodology used by Sridhar and Sridhar (2005). The methodology used a system of equations to estimate demand for and supply of telecom infrastructure. These equations were estimated along with the macro economy production function, using data for the period 1993 - 2004. The

system of equations was estimated separately for main telephone lines, cell phones and all telephone lines which include both main lines and cellular services. Given the growth in cellular service, demand for cellular services was used in a different model specification, as part of the system of equations, to analyze comparatively the contributions of main line and cellular mobile penetration to economic growth. The Three-Stage Least Squares (3SLS) econometric method of analysis was used to estimate the system of equations.

The three equations that were used are as follows:

a. The first considered both main telephone lines and cellular services,
b. The second considered only the main telephone service and
c. The third equation considered only the cellular mobile service.

The study arrived at a conclusion that main landline and cell phone penetration had significant effects on economic growth, when the effect of capital and labour is controlled. Again, the study discovered that traditional economic variables like income and price equally assisted in explaining the demand for mainland phones, but it was not so with the demand for cell phones.

Aker et al. (2010) examined the growth of mobile phone technology over the past decade and consider its potential impacts upon quality of life in low-income countries, with a particular focus on Sub-Saharan Africa. The study made use of descriptive statistics mainly to analyse its finding. The study concluded that Mobile phone usage in Sub-Saharan Africa has grown significantly over the past decade and now cover 60 percent of the population. Empirical evidence emanating from the study shows that mobile phones have the potential to benefit consumer and producer's welfare, and perhaps broader economic development.

Again, Fasoranti (2010) examined employment generation through the deregulated telecommunication sector. The study was conducted in Lagos state. The socio-economic characteristics of GSM operators, the profitability and efficiency of GSM operations and the influence of some selected macro economic variables on income generated from the business were the main variables considered in the study. The study made use of secondary as well as primary data. Information was elicited from 80 respondents randomly selected from some areas within Lagos. The data collected was analysed with the aid of descriptive statistics. The variables used included gross margin and net return analysis and multiple regression analysis. The Study shows that GSM operation was profitable. Again, the regression analysis shows that years of experience, cost of operation, amount of loans obtained and man-day are significant factors in the GSM business. The study recommends an expansion of operation by the operators and greater access to credit and that government should persuade service providers to improve their services and that government should make deliberate effort to reduce costs for GSM operators.

Datta and Agarwal (2004) extended the cross-country growth framework of Barro (1991) and Levine and Renelt (1992) 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. The study arrived at the conclusion that traditional land-line phones has less impact on economic growth to be in the sub-Saharan region, while the contribution of cellular phones to economic growth has been growing in importance and is highly significant.

Moreover, the study also found out that the marginal impact of cellular phones is greater wherever land-line phones are rare.

The above studies reviewed focused on cellular phones, land lines and FDI on telecommunication sectors and their relationship with employment generation, economic growth, and productivity proxied by GDP. However, this study intends to specifically evaluate the impact of GSM mobile lines in Nigeria, which is a subset of telecommunication related variable which is considered as a form of technology and how it affects the economic welfare of the citizens. This study intends to find out whether there is a correlation between GSM mobile line expansion (proxied by teledensity) and economic welfare (proxied by national per capita income) for the period between 1970 and 2010 and if there is a correlation to determine whether the impact is positive or negative on the welfare of citizens as earlier stated in the objectives.

CHAPTER THREE

METHODOLOGY

3.1 Sources of Data

The sources of data for this study included the use of both primary and secondary data. The primary data was obtained using structured questionnaires from 200 GSM mobile line subscribers in Abuja cutting across the four (4) major GSM networks comprising Mtn, Airtel, Globacom, and Etisalat in Abuja, randomly selected from Kubwa , Dutse , Lugbe, Kuje, Gwagwalada, Gwarinpa, Wuse and Central Area all within Abuja the Federal Capital Territory (F.C.T). Abuja, The F.C.T was selected as the area of study because it is the seat of the Nigerian government, the capital of Nigerian State and a place where all GSM operators are present and equally have great interest in. The sample from F.C.T has been more representing than that from any other location giving the nature of this study. On the other hand, the secondary data was obtained from the Nigerian Communication Commission's Annual Reports (Various Years), Central Bank of Nigeria's Annual Report and Statistical Bulletins, National Bureau of Statistics and National Population Commission.

3.2 Analytical framework

The analytical techniques adopted in this study are the Ordinary Least Squares (OLS), Cross Tabulation and Chi Square (X^2) test and descriptive statistics. The secondary data was analyzed using the Ordinary Least Squares (OLS), while, the primary data was analyzed using chi square (X^2) and cross tabulation test and simple descriptive statistics such as tables and percentages.

3.3 Model Specification

This research adopted and modifies the model developed by Datta and Agarwal (2004) which was built upon the growth framework of Barro (1991), and Levine and Renelt (1992) as follows:

$$GDPPCGR_{it} = \alpha GDPPCGR_{it-1} + \mathbf{X}_{it}\,\boldsymbol{\beta} + \mu_i + \upsilon_{it}$$

Where:

$$\mathbf{X}_{it-1} = [GDPPC,\ TRADE/GDP_{it},\ GDI/GDP_{it},\ GC/GDP_{it},$$

$$POPGR_{it},\ LANDPHONES100_{it},\ CELLPHONES100_{it},$$

$$LANDPHONES100_{it} \times CELLPHONES100_{it}],\ \text{and}$$

$$E[\mu_i] = E[\upsilon_{it}] = E[\mu_{it}\,\upsilon_{it}] = 0$$

In the above growth equation, μ_i and ν_{it} are the unobserved country-specific effects and idiosyncratic shocks, respectively. GDPPC is GDP per capita, and GDPPCGR is the growth rate of GDP per capita. Assuming a dynamic process in which the current value of the dependent variable may be influenced by past ones, the lagged value of GDPPCGR is controlled for on the right-hand side. As a standard measure to test for convergence, the lagged value of GDPPC is also included. TRADE/GDP is a country's trade volume as a share of its GDP and is a proxy for the degree of openness of a country's economy. POPGR is the growth rate of population and GDI/GDP is gross domestic investment as a share of GDP. GC/GDP is government consumption expenditure for goods and services as a share of GDP. GC/GDP is included to estimate the effect on economic growth of the proportion of government consumption expenditure relative to GDP. As widely evidenced in the economic

growth literature, negative coefficients are expected for POPGR, the lagged values of GDPPCGR, and GDPPC while positive coefficients for TRADE/GDP and GDI/GDP. LANDPHONES100 is the number of main telephone lines per 100 people and serves as an indicator of the penetration of conventional land-line telephony. Similarly, CELLPHONES100 is defined as the number of mobile phone subscribers per 100 people. Both LANDPHONES100 and CELLPHONES100 are expected to be positively correlated with economic growth. Lastly, we include an interaction term between LANDPHONES100 and CELLPHONES100. The interaction term is included in order to allow the marginal impact of cellular phones to vary with the level of land-lines that are already in place. In a region like sub-Saharan Africa where cellular phone penetration far exceeds that of land-lines, a negative coefficient is expected. This implies that the impact on economic growth of mobile telecommunications is more pronounced when the penetration of land-lines is relatively low.

However, this study has adopted and modified the model above in order to achieve the purpose of this research. Therefore, the model for this study has been defined as:

$$EW_t = \beta_1 + \beta_2 \log(GFCF)_{t-1} + \beta_3 \log(FDI)_{t-1} + \beta_4 \log(TRDOP)_t + \beta_5(GMLTD)_{t-1} + \beta_6(Dummy) + \varepsilon t$$

Where:

EW = Economic Welfare of citizens proxied by national per capita income.

GDP = Gross Domestic Product

GFCF = Gross Fixed Capital Formation

FDI= Foreign Direct Investment

TRDOP = Trade openness (i.e. export minus import)

GML = GSM mobile lines teledensity in Nigeria.

DUMMY= Denotes the existence of GSM services

εt = the error term which represents other factors that are not captured by the independent variable.

β_1 = the intercept of the regression equation and,

β_2 - β_6 = the coefficients or slopes of the independent variables of the regression equation.

The OLS technique was used to estimate the parameters of the regression equation (model) and test the relationship that exists between the expansion of GSM mobile lines and the economic welfare of citizens from the year 1970 – 2010. The study equally explores the use of Coefficient of Correlation (r) and Coefficient of Determination (R^2) to determine the strength of the relationship between the two variables. That is, the expansion of GSM mobile lines and economic welfare of citizens. Also, test for stationarity was carried out to avoid spurious regression result. Finally, the regression result was used to validate alternate hypothesis (H_1) that GSM services have impact on economic welfare of Nigerian citizens.

On the other hand, the cross tabulation and X^2 test was used to test for service delivery and efficiency of GSM services in Nigeria.

CHAPTER FOUR

4.1 DATA PRESENTATION AND ANALYSIS

This chapter presents and analyses the data collected in relation to the objectives and hypotheses which have been formulated for the study. Having used both quantitative and qualitative techniques to achieve the objectives of this research, the results are presented in turn. Item 4.2 presents the quantitative result while 4.3 presents the qualitative results.

4.1.1 REGRESSION ANALYSIS

Estimation of model parameters is based on Economic Welfare of citizens (EW), Gross Fixed Capital Formation (GFCF), Foreign Direct Investment (FDI), GSM mobile lines teledensity in Nigeria (GMLTD) and DUMMY which denotes the existence of GSM services in Nigeria as presented below with relevant statistics for analysis. The desired estimated results were obtained following a semi log model.

$$\mathbf{EW_t = -5.25 - 1.33logGFCF_{t-1} + 0.34logFDI_{t-1} + 0.04logTRDOP_t + 2.93GMLTD_{t-1} + 0.75DUM}$$

Table 4.1: Regression Analysis Table

SE:	**(0.352)**	**(0.286)**	**(0.129)**	**(1.177)**	**(0.319)**
t-test	**(-3.62)***	**(1.18)**	**(0.30)**	**(2.49)***	**(2.23)***
P-value	**(0.001)**	**(0.225)**	**(0.765)**	**(0.022)**	**(0.028)**
R^2= 0.81, R^{-2}= 0.76, DW = 1.67, F-test =16.33, p-value = (0.00), significance = 5%					

From the regression result obtained above, the Durbin-Watson value of 1.67 implies the absence of serial correlation, this is because its value fall between 1.5 and 2.5 which presupposes the properties of Best Linear Unbiased Estimator (BLUE), while

the value of R^2 shows that 81% of the variations in economic welfare is explained by the variables included, suggesting a good fit for the model.

A positive and significant relationship was reported between GSM mobile lines teledensity (GMLTD) and EW. The coefficient of GMLTD suggest that for every 1% increase GSM teledensity, the Nigeria per capita income rises by 2.93% That is, if GMLTD is increased by one percentage point, EW will increase by 2.93 percentage points. This is in line with the a priori expectations of the study, implying that, the more the GSM mobile teledensity lines lagged by one period are increased, the more the economic welfare of the people will be improved.

Again, we observed a positive and significant effect of the dummy variable (DUM) that captures the existence of GSM in Nigeria. The coefficient of 0.75 implies that economic welfare is on the average higher by 0.75% in the period after GSM was introduced in Nigeria relative to when there was no GSM. The result is plausible because of the role GSM plays in the economic and social life of the citizens in terms of income generation, job creation, and access to information. The emergence of GSM in Nigeria has created jobs for many in the area of GSM related product and service and it is also the major source of livelihood for many. Lastly, with GSM at our disposal we have easy access to relevant and productive information. All these benefit has promoted increased welfare of the citizens.

We observed a negative and significant relationship between gross fix capital formation (GFCF) and economic welfare (EW). That is, a percentage increase in GFCF leads to a decrease in EW by 1.33 percent. This finding suggests that increasing the level of gross fix capital formation in the Country only benefit investors and not entire welfare of the people. This is in line with various endogenous

growth models that consider investment in human capital rather than physical capital as a stimulant to economic welfare.

Table 4.1 reported a positive and insignificant relationship between foreign direct investment (FDI) and EW. That is, an increase in the previous year's FDI by one percent, increases EW by 0.34 percent. This result is in line with the findings by Adeolu, (2007). He attributed this to the poor business environment in the country and the low level of available human capital development in Nigeria. This suggests that an increase in FDI may not necessarily increase the economic welfare of the citizens significantly. This is as a result of the fact that, most of the Foreign Direct Investment is mostly invested on machines and equipment rather than on human capital development, and coupled with the issue of profit repatriation rather than ploughing back the profit. A significant proportion of the FDI are channelled into the telecom sector but its effect on the economic welfare is insignificant basically because of the issue of profit repatriation.

The inability of trade openness (TRDOP) to increase the economic welfare of the citizens is shown by positive and insignificant relationship between TRDOP and EW. This may be attributed to the terms of trade which do not favour the economy thus inhibiting the rise in economic welfare of the populace.

OBJECTIVE 1

Examine the impact of the growth of GSM lines on the economic welfare of citizens in Nigeria.

Objective one and hypothesis one has been achieved and tested as presented above by the use of DUM and GMLTD variables. In the light of the above findings, we reject

the null hypothesis (H_0) and accept the alternate (H_1) that GSM services have impact on economic welfare of Nigerians at 5% level of significance.

4.2 QUALITATIVE ANALYSIS

4.2.1 DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

This section presents the result of the qualitative data collected. The personal and socio-economic characteristics of the respondents were examined by collecting data on their age, sex, employment status, level of education and marital status with the view of finding how these features affect their responses.

4.2.2 AGES OF THE GSM SUBSCRIBERS

From the result obtained, it was observed that more than 96.5% of the subscribers (respondents) are less than 40yrs while about 3.5% fall between the age s of 40 and 64yrs. It can be stated that a significant proportion of the respondents fall within the labour force and anything affecting the economic wellbeing of this segment of the population will surely affect that of their dependants. Table 4.2 shows the results.

Table 4.2: Age of the GSM Subscribers

Age	Frequency	Percent	Cumulative Percent
No response	6	3.0	3.0
18-28yrs	85	42.5	45.5
29-39yrs	102	51.0	96.5
40-50yrs	6	3.0	99.5
51-64yrs	1	.5	100.0
Total	200	100.0	

Source: Field Survey, 2011

4.2.3 SEX OF THE GSM SUBSCRIBERS

It was also observed that one percent of the respondent did not specify their gender, 41.5% were females while 57.5% were males, which is roughly more than 50% of the respondents as shown in Table 4.3.

Table 4.3: Table 4.2: Sex of the GSM Subscribers.

Sex		Frequency	Percent	Cumulative Percent
Valid	No response	2	1.0	1.0
	Male	115	57.5	58.5
	Female	83	41.5	100.0
	Total	200	100.0	

Source: Field Survey, 2011

4.2.4 LEVEL OF EDUCATION OF THE GSM SUBSCRIBERS

The data obtained shows that 95% of the respondents were at least graduates, with either B.Sc or HND results while the remaining 5% has NCE/OND and below as indicated in Table 4.4

Table 4.4: Level of Education of the GSM Subscribers.

	Level of Education	Frequency	Percent	Cumulative Percent
Valid	Postgraduate	43	21.5	21.5
	Graduate	147	73.5	95.0
	NCE or OND	3	1.5	96.5
	WAEC	7	3.5	100.0
	Total	200	100.0	

Source: Field Survey, 2011

4.2.5 EMPLOYMENT STATUS OF THE GSM SUBSCRIBERS

Again, it was noticed from the data obtained that majority of the respondents are employed. About 93% of the subscribers are gainfully and economically productive. That means they contribute to the growth of the Nigerian economy.

Table 4.5: Employment Status of the GSM Subscribers.

	Employment Status	Frequency	Percent	Cumulative Percent
Valid	No response	3	1.5	1.5
	Employed	184	92.0	93.5
	Unemployed	5	2.5	96.0
	Student	8	4.0	100.0
	Total	200	100.0	

Source: Field Survey, 2011

4.2.6 DURATION OF SUBSCRIPTION OF THE GSM SUBSCRIBERS.

From the response rate of the respondents it was observed that 90.5% of the respondents have been subscribed to GSM services for at least 4yrs. Besides, the emergence of GSM in Nigeria is more than 10 years ago and for that reason the subscribers deserve the best of service. Table 4.6 present the details.

Table 4.6: Duration of Subscription of the GSM Subscribers.

Duration		Frequency	Percent	Cumulative Percent
Valid	0-3yrs	19	9.5	9.5
	4-6yrs	63	31.5	41.0
	7-9yrs	91	45.5	86.5
	10yrs and above	27	13.5	100.0
	Total	200	100.0	

Source: Field Survey, 2011

4.2.7 AMOUNT SPENT MONTHLY BY THE GSM SUBSCRIBERS.

From Table 4.7, it was observed that about 62.5% of the respondents spend at least N4001 averagely on monthly basis on GSM services. It therefore means that GSM subsector has an impact on the nation's economy given the potential multiplier effects of such spending within the Nigerian economy.

Table 4.7: Amount Spent Monthly by the GSM Subscribers.

Amount Spent		Frequency	Percent	Cumulative Percent
Valid	No response	3	1.5	1.5
	N1-N2,000	31	15.5	17.0
	N2,001-N4,000	41	20.5	37.5
	N4,001- N6,000	43	21.5	59.0
	N6,001-N8,000	24	12.0	71.0
	N8,001 and above	58	29.0	100.0
	Total	200	100.0	

Source: Field Survey, 2011

4.2.8 PURPOSE OF SUBSCRIPTION BY THE GSM SUBSCRIBERS.

Again, it was observed from the responses that 98% of the respondents used their GSM lines both for business and personal purposes. It implies that GSM lines are used for social as well as economic and financial purposes. Table 4.8 shows the findings.

Table 4.8: Purpose of Line Usage

Purpose of line usage		Frequency	Percent	Cumulative Percent
Valid	business	4	2.0	2.0
	personal	74	37.0	39.0
	both	122	61.0	100.0
	Total	200	100.0	

Source: Field Survey, 2011

OBJECTIVE 2

- To Highlight the opinions of GSM mobile subscribers and identify the shortcomings of GSM service delivery in Nigeria.

To achieve this objective, we are going to look at Table 4.9 that captures this objective.

Table 4.9: Shortcomings of GSM services in Nigeria

Shortcomings	Frequency	Percent
No response	28	14.0
Poor network, Internet and Coverage issues	81	40.5
High tariff	56	28.0
Recharge and SMS issues	1	.5
Poor customer care	10	5.0
poor regulation, Ignorance, greed and integrity issue and dropped balance	24	12.0
Total	200	100.0

Source: Field Survey, 2011

4.3 SHORTCOMINGS OF GSM SERVICES IN NIGERIA

Table 4.9 shows the opinions of GSM subscribers regarding the shortcomings of GSM service delivery in Nigeria. Some of the shortcomings of GSM service delivery in Nigeria as identified by the subscribers include:

I. Poor network, internet and coverage issues
II. High tariff
III. Recharge and SMS (text message) issues
IV. Poor customer care issue.
V. Poor regulation, infrastructures and competitions.
VI. Ignorance, integrity issues and issues of dropped balance

In an ascending order of response it was observed that 0.5% of the respondents identified recharge and a SMS (text message) issue which is the least identified issue. Five percent identified poor customer care attitude and enlightenment as a shortfall. Twelve percent are of the opinion that it is poor regulation, infrastructure and competitions. Fourteen percent did not respond to the question while 28% expressed high tariff on GSM services as shortcoming and 40% said it is poor network, Internet and coverage issues are factors militating against GSM service delivery in Nigeria. Put differently, the major problems facing GSM services in Nigeria is poor connectivity and high tariff. Nevertheless, all the factors identified above have an effect whether major, minor or infinitesimal on the level and efficiency of GSM service delivery in Nigeria.

OBJECTIVE 3

To make recommendations on how GSM service delivery (that is, GSM users' satisfaction) can be improved in Nigeria based on identified failures and shortcomings on the part of GSM operators.

Again, to achieve objective three (3), Table 4.10 captures this objective. Below is Table 4.10 that captures the objective.

Table 4.10: Remedies to GSM Issues in Nigeria

Remedies	Frequency	Percent	Cumulative Percent
No response	14	7.0	7.0
improve network, internet and coverage issues	101	50.5	57.5
reduce high tariff rate	47	23.5	81.0
improve recharge and SMS issues	2	1.0	82.0
improve customer care and service enlightenment	21	10.5	92.5
improved government regulation, infrastructure and promote competition	15	7.5	100.0
Total	200	100.0	100.0

Source: Field Survey, 2011

4.4 REMEDIES TO GSM ISSUES IN NIGERIA

From Table 4.10 the subscribers recommended the following measures as a way of attaining effective and efficient GSM service delivery in Nigeria.

I. Improvement in network, Internet and coverage issues.

II. Reduction or moderation of tariff rate to be more affordable to subscribers.

III. Improvement in recharge and SMS (text message) related issues.

IV. Improvement of customer care delivery and subscribers enlightenment.

V. Improved government regulation, infrastructure and promoting healthy competitions.

From the response rate, 50.5% of the respondents suggested improvement in network, internet and coverage issues. Twenty-three percent recommended reduction or moderation of tariff rate to be more affordable to subscribers. Two percent said improvement in recharge and SMS (text message) related issues will make a positive impact. That is, the issue of undelivered SMS should be minimised or out rightly resolved. Ten percent believed in improvement of customer care delivery and subscribers enlightenment. Seven point five percent are of the opinion that improved government regulation, infrastructure and promoting healthy competitions in the GSM subsector will improve service delivery while the remaining 7% did not respond to the question.

The respondents believed that if the following recommendations are put in place GSM service delivery will take a positive dimension in Nigeria.

TEST OF HYPOTHESIS TWO

The hypothesis two is stated below:

Hypothesis Two:

H_0: GSM service delivery is poor and inefficient in Nigeria

H_1: GSM service delivery is good and efficient in Nigeria.

DECISION RULE FOR CHI SQUARE (X^2)

The general decision rule for chi square X^2 is expressed as follow:

Accept H_O if X^2 calculated < X^2 tabulated and reject the H_1

Reject H_O if X^2 calculated > X^2 tabulated and accept H_1

Where: H_O : GSM service delivery is poor and inefficient in Nigeria.

H_1 : GSM service delivery is good and efficient in Nigeria.

Below is the result of the Chi square test performed to test for the level of significance between the variables consumers' satisfaction and Voice clarity issues as shown in Table 4.11.

Table 4.11: Voice clarity issues * consumer satisfaction

Crosstab

			Consumer satisfaction			
			No response	Yes	No	Total
Voice clarity issues	Yes	Count	1	31	165	197
		Expected Count	1.0	31.5	164.5	197.0
		% of Total	.5%	15.5%	82.5%	98.5%
	No	Count	0	1	2	3
		Expected Count	.0	.5	2.5	3.0
		% of Total	.0%	.5%	1.0%	1.5%
	Total	Count	1	32	167	200
		Expected Count	1.0	32.0	167.0	200.0

Crosstab

			Consumer satisfaction			
			No response	Yes	No	Total
Voice clarity issues	Yes	Count	1	31	165	197
		Expected Count	1.0	31.5	164.5	197.0
		% of Total	.5%	15.5%	82.5%	98.5%
	No	Count	0	1	2	3
		Expected Count	.0	.5	2.5	3.0
		% of Total	.0%	.5%	1.0%	1.5%
	Total	Count	1	32	167	200
		Expected Count	1.0	32.0	167.0	200.0
		% of Total	.5%	16.0%	83.5%	100.0%

Source: Field Survey, 2011

Table 4.12: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.690[a]	2	.708
Likelihood Ratio	.578	2	.749
Linear-by-Linear Association	.535	1	.464
N of Valid Cases	200		

Source: Field Survey 2011

From the result of cross tabulation and chi square (X^2) between consumers satisfaction and Voice clarity issues in Table 4.12

X^2 calculated = 0. .690

X^2 tabulated = 9.49

Therefore,

X^2 calculated (0.690) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. About 82.5% of the respondents said they are not satisfied with GSM service delivery and that they experience issues of Voice clarity while making or receiving calls.

The result of the Chi square (X^2) test performed to test for the level of significance between the variables One-way speech issues and consumer satisfaction as shown in Table 4.13

Table 4.13: One-way speech issues * consumer satisfaction

Crosstab

			Consumer satisfaction			
			No response	Yes	No	Total
One-way speech issues	No response	Count	0	0	1	1
		Expected Count	.0	.2	.8	1.0
		% of Total	.0%	.0%	.5%	.5%
	Yes	Count	1	27	161	189
		Expected Count	.9	30.2	157.8	189.0
		% of Total	.5%	13.5%	80.5%	94.5%

	No	Count	0	5	5	10
		Expected Count	.0	1.6	8.4	10.0
		% of Total	.0%	2.5%	2.5%	5.0%
	Total	Count	1	32	167	200
		Expected Count	1.0	32.0	167.0	200.0
		% of Total	.5%	16.0%	83.5%	100.0%

Source: Field Survey, 2011

Table 4.14: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.231[a]	4	.056
Likelihood Ratio	7.054	4	.133
Linear-by-Linear Association	7.484	1	.006
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 9.231

X^2 tabulated = 9.49

Therefore,

X^2 calculated (9.231) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. 80.5% of the respondents claimed that they experience One-way speech issues and that they are not satisfied as consumers.

More so, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables, unsubscribed service charges and consumer satisfaction

Table 4.15: Unsubscribed service charges * consumer satisfaction

Crosstab

			Consumer satisfaction			
			No response	Yes	No	Total
Unsubscribed service charges	No response	Count	0	0	4	4
		Expected Count	.0	.6	3.3	4.0
		% of Total	.0%	.0%	2.0%	2.0%
	Yes	Count	1	10	71	82
		Expected Count	.4	13.1	68.5	82.0
		% of Total	.5%	5.0%	35.5%	41.0%
	No	Count	0	22	92	114
		Expected Count	.6	18.2	95.2	114.0
		% of Total	.0%	11.0%	46.0%	57.0%
	Total	Count	1	32	167	200
		Expected Count	1.0	32.0	167.0	200.0
		% of Total	.5%	16.0%	83.5%	100.0%

Source: Field Survey, 2011

Table 4.16: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.927[a]	4	.416
Likelihood Ratio	4.922	4	.295
Linear-by-Linear Association	1.247	1	.264
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 3.927

X^2 tabulated = 9.49

Therefore,

X^2 calculated (3.927) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. From Table 4.15, 35.5% of the respondents opined that they are billed for unsubscribed services and that they are not satisfied not satisfied as consumers.

Similarly, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables Charges for undelivered SMS and consumer satisfaction as shown in Table 4.17.

Table 4.17: Charged for undelivered SMS * consumer satisfaction

Crosstab

			Consumer satisfaction			
			No response	Yes	No	Total
Charged for undelivered SMS	Yes	Count	1	27	149	177
		Expected Count	.9	28.3	147.8	177.0
		% of Total	.5%	13.5%	74.5%	88.5%
	No	Count	0	5	18	23
		Expected Count	.1	3.7	19.2	23.0
		% of Total	.0%	2.5%	9.0%	11.5%
	Total	Count	1	32	167	200
		Expected Count	1.0	32.0	167.0	200.0
		% of Total	.5%	16.0%	83.5%	100.0%

Source: Field Survey, 2011

Table 4.18: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.750[a]	2	.687
Likelihood Ratio	.819	2	.664
Linear-by-Linear Association	.384	1	.535
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 0.750

X^2 tabulated = 9.49

Therefore,

X^2 calculated (0.750) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Also, 74.5% of the respondents complained that they are usually charged for unsubscribed services and that they are not satisfied as consumers.

From the result of the chi square (X^2) test performed to test for the level of significance between the variables Network issues and easy access to customer care as shown in Table 4.19.

Table 4.19: Network issues * easy access to customer care

Crosstab

			Easy access to customer care			
			No response	Yes	No	Total
Network issues	No response	Count	0	0	2	2
		Expected Count	.0	.8	1.1	2.0
		% of Total	.0%	.0%	1.0%	1.0%
	Yes	Count	2	79	102	183
		Expected Count	1.8	76.9	104.3	183.0
		% of Total	1.0%	39.5%	51.0%	91.5%
	No	Count	0	5	10	15
		Expected Count	.2	6.3	8.6	15.0
		% of Total	.0%	2.5%	5.0%	7.5%
	Total	Count	2	84	114	200
		Expected Count	2.0	84.0	114.0	200.0
		% of Total	1.0%	42.0%	57.0%	100.0%

Source: Field Survey, 2011

Table 4.20: **Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.299[a]	4	.681
Likelihood Ratio	3.196	4	.526
Linear-by-Linear Association	.120	1	.729
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 2.299

X^2 tabulated = 9.49

Therefore,

X^2 calculated (2.299) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Besides, 51% of the respondents said that they experience network issues, yet they do not have access to customer care units.

Besides, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables, Drop balance issue and easy access to customer care as shown in Table 4.21.

Table 4.21: Drop balance issue * easy access to customer care

Crosstab

			Easy access to customer care			
			No response	Yes	No	Total
Drop balance issue	No response	Count	0	0	3	3
		Expected Count	.0	1.3	1.7	3.0
		% of Total	.0%	.0%	1.5%	1.5%
	Yes	Count	0	64	82	146
		Expected Count	1.5	61.3	83.2	146.0
		% of Total	.0%	32.0%	41.0%	73.0%
	No	Count	2	20	29	51
		Expected Count	.5	21.4	29.1	51.0
		% of Total	1.0%	10.0%	14.5%	25.5%
	Total	Count	2	84	114	200
		Expected Count	2.0	84.0	114.0	200.0
		% of Total	1.0%	42.0%	57.0%	100.0%

Table 4.22: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.306[a]	4	.081
Likelihood Ratio	9.009	4	.061
Linear-by-Linear Association	.729	1	.393
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 8.306

X^2 tabulated = 9.49

Therefore,

X^2 calculated (8.306) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. 41% of the respondents said that they experience drop balance issues, yet they do not have easy access to customer care units.

Below is the result of the Chi square test performed to test for the level of significance between the variables, Voice clarity issues and easy access to customer care units as captured by Table 4.23.

Table 4.23: Voice clarity issues * easy access to customer care

Crosstab

			Easy access to customer care			
			No response	Yes	No	Total
Voice clarity issues	Yes	Count	2	83	112	197
		Expected Count	2.0	82.7	112.3	197.0
		% of Total	1.0%	41.5%	56.0%	98.5%
	No	Count	0	1	2	3
		Expected Count	.0	1.3	1.7	3.0
		% of Total	.0%	.5%	1.0%	1.5%
	Total	Count	2	84	114	200
		Expected Count	2.0	84.0	114.0	200.0
		% of Total	1.0%	42.0%	57.0%	100.0%

Table 4.24 : Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.135[a]	2	.935
Likelihood Ratio	.166	2	.920
Linear-by-Linear Association	.129	1	.719
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 0.135

X^2 tabulated = 9.49

Therefore,

X^2 calculated (0.135) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. More so, 56% of the respondents claimed that they experience issues with Voice clarity, yet do not have easy access to customer care units.

In addition, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables, One-way speech issues and easy access to customer care units as shown in Table 4.25.

Table 4.25: One-way speech issues * easy access to customer care

Crosstab

			Easy access to customer care			
			No response	Yes	No	Total
One-way speech issues	No response	Count	0	0	1	1
		Expected Count	.0	.4	.6	1.0
		% of Total	.0%	.0%	.5%	.5%
	Yes	Count	2	78	109	189
		Expected Count	1.9	79.4	107.7	189.0
		% of Total	1.0%	39.0%	54.5%	94.5%
	No	Count	0	6	4	10
		Expected Count	.1	4.2	5.7	10.0
		% of Total	.0%	3.0%	2.0%	5.0%
	Total	Count	2	84	114	200
		Expected Count	2.0	84.0	114.0	200.0
		% of Total	1.0%	42.0%	57.0%	100.0%

Source: Field Survey, 2011

Table 4.26: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.178[a]	4	.703
Likelihood Ratio	2.616	4	.624
Linear-by-Linear Association	1.467	1	.226
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 2.178

X^2 tabulated = 9.49

Therefore,

X^2 calculated (2.178) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Again, 54.5% of the respondents believed that they experience One-way speech issues, yet they do not have easy access to customer care units.

Consequently, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables, unsubscribed service charges and easy access to customer care as shown in Table 4.27

Table 4.27: Unsubscribed service charges * easy access to customer care

Crosstab

			Easy access to customer care			
			No response	Yes	No	Total
Unsubscribed service charges	No response	Count	0	1	3	4
		Expected Count	.0	1.7	2.3	4.0
		% of Total	.0%	.5%	1.5%	2.0%
	Yes	Count	2	33	47	82
		Expected Count	.8	34.4	46.7	82.0
		% of Total	1.0%	16.5%	23.5%	41.0%
	No	Count	0	50	64	114
		Expected Count	1.1	47.9	65.0	114.0
		% of Total	.0%	25.0%	32.0%	57.0%
	Total	Count	2	84	114	200
		Expected Count	2.0	84.0	114.0	200.0
		% of Total	1.0%	42.0%	57.0%	100.0%

Source: Field Survey, 2011

Table 4.28: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.551[a]	4	.470
Likelihood Ratio	4.265	4	.371
Linear-by-Linear Association	.023	1	.878
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 3.551

X^2 tabulated = 9.49

Therefore,

X^2 calculated (3.551) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Furthermore, 23.5% of the respondents believed that they experience unsubscribed service charges, yet they do not have easy access to customer care units.

Furthermore, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables Charged for undelivered SMS and easy access to customer care as shown in Table 4.29.

Table 4.29: Charged for undelivered SMS * easy access to customer care

Crosstab

			Easy access to customer care			
			No response	Yes	No	Total
Charged for undelivered SMS	Yes	Count	2	75	100	177
		Expected Count	1.8	74.3	100.9	177.0
		% of Total	1.0%	37.5%	50.0%	88.5%
	No	Count	0	9	14	23
		Expected Count	.2	9.7	13.1	23.0
		% of Total	.0%	4.5%	7.0%	11.5%
	Total	Count	2	84	114	200
		Expected Count	2.0	84.0	114.0	200.0
		% of Total	1.0%	42.0%	57.0%	100.0%

Source: Field Survey, 2011

Table 4.30: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.379[a]	2	.827
Likelihood Ratio	.608	2	.738
Linear-by-Linear Association	.230	1	.631
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 0.379

X^2 tabulated = 9.49

Therefore,

X^2 calculated (0.379) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Also, 88.5% of the respondents believed that they have been charged for SMS that was never delivered while 57% claimed they do not have easy access to customer care units.

Also, from the result of the chi square (X^2) test performed to test for the level of significance between the variables Network issues and the need for improvement as shown.

Table 4.31: Network issues * is there room for improvement

Crosstab

			Is there room for improvement			
			No response	Yes	No	Total
Network issues	No response	Count	0	2	0	2
		Expected Count	.1	1.9	.0	2.0
		% of Total	.0%	1.0%	.0%	1.0%
	Yes	Count	8	172	3	183
		Expected Count	8.2	172.0	2.7	183.0
		% of Total	4.0%	86.0%	1.5%	91.5%
	No	Count	1	14	0	15
		Expected Count	.7	14.1	.2	15.0
		% of Total	.5%	7.0%	.0%	7.5%
	Total	Count	9	188	3	200
		Expected Count	9.0	188.0	3.0	200.0
		% of Total	4.5%	94.0%	1.5%	100.0%

Source: Field Survey, 2011

Table 4.32: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.540[a]	4	.969
Likelihood Ratio	.864	4	.930
Linear-by-Linear Association	.388	1	.533
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 0.540

X^2 tabulated = 9.49

Therefore,

X^2 calculated (0.540) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Similarly, 91.5% of the respondents opined that they experienced network issues while 94% believed that there is need for improvement.

Again, from the result of the Chi square (X^2) test performed to test for the level of significance between the Drop balance issues and is there room for improvement as shown in Table 4.33.

Table 4.33: Drop balance issue * is there room for improvement

Crosstab

			Is there room for improvement			
			No response	Yes	No	Total
Drop balance issue	No response	Count	0	3	0	3
		Expected Count	.1	2.8	.0	3.0
		% of Total	.0%	1.5%	.0%	1.5%
	Yes	Count	9	137	0	146
		Expected Count	6.6	137.2	2.2	146.0
		% of Total	4.5%	68.5%	.0%	73.0%
	No	Count	0	48	3	51
		Expected Count	2.3	47.9	.8	51.0
		% of Total	.0%	24.0%	1.5%	25.5%
	Total	Count	9	188	3	200
		Expected Count	9.0	188.0	3.0	200.0
		% of Total	4.5%	94.0%	1.5%	100.0%

Source: Field Survey, 2011

Table 4.34: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.105[a]	4	.017
Likelihood Ratio	13.875	4	.008
Linear-by-Linear Association	7.813	1	.005
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 12.105

X^2 tabulated = 9.49

Therefore, X^2 calculated (12.105) >X^2 tabulated (9.49).

Since X^2 calculated >X^2 tabulated, we therefore accept H_1 that GSM service delivery is good and efficient in Nigeria at 5% level of significance. However, 73 % of the respondents said that they experienced drop balance issues while 94% believed that there is need for improvement.

Furthermore, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables Voice clarity issues and the need for improvement as shown in Table 4.35.

Table 4.35: Voice clarity issues * is there room for improvement

Crosstab

			Is there room for improvement			
			No response	Yes	No	Total
Voice clarity issues	Yes	Count	9	185	3	197
		Expected Count	8.9	185.2	3.0	197.0
		% of Total	4.5%	92.5%	1.5%	98.5%
	No	Count	0	3	0	3
		Expected Count	.1	2.8	.0	3.0
		% of Total	.0%	1.5%	.0%	1.5%
	Total	Count	9	188	3	200
		Expected Count	9.0	188.0	3.0	200.0
		% of Total	4.5%	94.0%	1.5%	100.0%

Source: Field Survey, 2011

Table 4.36: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.194[a]	2	.907
Likelihood Ratio	.374	2	.829
Linear-by-Linear Association	.046	1	.830
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 0.194

X^2 tabulated = 9.49

Therefore,

X^2 calculated (0.194) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. In addition, 98.5 % of the respondents complained that they experienced voice clarity issues, while 94% believed that there is need for improvement.

Furthermore, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables One-way speech issues and is there room for improvement as shown in Table 4.37.

Table 4.37: One-way speech issues * is there room for improvement

Crosstab

			Is there room for improvement			
			No response	Yes	No	Total
One-way speech issues	No response	Count	0	1	0	1
		Expected Count	.0	.9	.0	1.0
		% of Total	.0%	.5%	.0%	.5%
	Yes	Count	8	179	2	189
		Expected Count	8.5	177.7	2.8	189.0
		% of Total	4.0%	89.5%	1.0%	94.5%
	No	Count	1	8	1	10
		Expected Count	.5	9.4	.2	10.0
		% of Total	.5%	4.0%	.5%	5.0%
	Total	Count	9	188	3	200
		Expected Count	9.0	188.0	3.0	200.0
		% of Total	4.5%	94.0%	1.5%	100.0%

Source: Field Survey, 2011

Table 4.38: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.047[a]	4	.196
Likelihood Ratio	3.250	4	.517
Linear-by-Linear Association	.116	1	.734
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 6.047

X^2 tabulated = 9.49

Therefore,

X^2 calculated (6.047) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Furthermore, 94.5 % of the respondents complained that they experienced One-way speech issues, while 94% believed that there is need for improvement.

Furthermore, from the result of the chi square (X^2) test performed to test for the level of significance between the variables unsubscribed service charges and the need for improvement as shown in Table 4.39.

Table 4.39: Unsubscribed service charges * is there room for improvement

Crosstab

			Is there room for improvement			
			No response	Yes	No	Total
Unsubscribed service charges	No response	Count	1	3	0	4
		Expected Count	.2	3.8	.1	4.0
		% of Total	.5%	1.5%	.0%	2.0%
	Yes	Count	2	78	2	82
		Expected Count	3.7	77.1	1.2	82.0
		% of Total	1.0%	39.0%	1.0%	41.0%
	No	Count	6	107	1	114
		Expected Count	5.1	107.2	1.7	114.0
		% of Total	3.0%	53.5%	.5%	57.0%
	Total	Count	9	188	3	200
		Expected Count	9.0	188.0	3.0	200.0
		% of Total	4.5%	94.0%	1.5%	100.0%

Source: Field Survey, 2011

Table 4.40: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.659[a]	4	.226
Likelihood Ratio	3.907	4	.419
Linear-by-Linear Association	.143	1	.705
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 5.659

X^2 tabulated = 9.49

Therefore,

X^2 calculated (5.659) < X^2 tabulated (9.49).

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. More so, 41% of the respondents complained of being billed for unsubscribed services while 94% believed that there is need for improvement.

Furthermore, from the result of the Chi square (X^2) test performed to test for the level of significance between the variables Charged for undelivered SMS and the need for improvement as shown in Table 4.41.

Table 4.41: Charged for undelivered SMS * is there room for improvement

Crosstab

			Is there room for improvement			
			No response	Yes	No	Total
Charged for undelivered SMS	Yes	Count	9	165	3	177
		Expected Count	8.0	166.4	2.7	177.0
		% of Total	4.5%	82.5%	1.5%	88.5%
	No	Count	0	23	0	23
		Expected Count	1.0	21.6	.3	23.0
		% of Total	.0%	11.5%	.0%	11.5%
	Total	Count	9	188	3	200
		Expected Count	9.0	188.0	3.0	200.0
		% of Total	4.5%	94.0%	1.5%	100.0%

Source: Field Survey, 2011

Table 4.42: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.659[a]	2	.436
Likelihood Ratio	3.030	2	.220
Linear-by-Linear Association	.394	1	.530
N of Valid Cases	200		

Source: Field Survey, 2011

X^2 calculated = 1.659

X^2 tabulated = 9.49

Therefore,

X^2 calculated (1.659) < X^2 tabulated (9.49). 1.659

Since X^2 calculated < X^2 tabulated, we therefore accept H_O that GSM service delivery is poor and inefficient in Nigeria at 5% level of significance. Also, 88.5% of the respondents complained that they have been billed for undelivered SMS while 94% believed in the need for improvement.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY OF FINDINGS

The study investigated GSM coverage in Nigeria and its impact on the economic welfare of citizens. The study used both primary and secondary data. The secondary data was analyzed with the Ordinary Least Squares (OLS) using a semi log model while the primary data was analyzed using simple descriptive statistics, cross tabulation and chi-square (X^2) analysis. The study was able to establish that a positive and significant relationship exists between GSM mobile lines teledensity (GMLTD) and the economic welfare of citizens (EW). This implies that 1% increase in GMLTD lagged by one period will increase the EW by 2.93%. Also, the study, using the DUMMY variable was able to establish that the welfare of citizens has increased relative to the era before the introduction of GSM. The welfare of citizens has risen by 0.75% since the emergence of GSM.

Besides, the study equally identified the various challenges facing GSM subscribers in Nigeria as shown in Table 4.9. Some of the challenges identified include Poor network, Internet and coverage issues, High tariff, Recharge and SMS issues, Poor customer care service, Poor regulation, infrastructure and competitions. Again, with the aid of the primary data, using cross tabulation and Chi square analysis, the study was able to establish that GSM service delivery in Nigeria is poor and not as efficient as it should be. That is, despite the positive impacts of GSM services on the economic and social lives of the subscribers, GSM service delivery is poor and inefficient in Nigeria. Lastly, the study was able to identify possible solutions to some of the

challenges facing subscribers in Nigeria as shown in Table 4.10. Some of the solutions include improvement on network, Internet, coverage, recharge and SMS related issues; Reduction on call and data tariff rate; improvement of customer care delivery, and improvement of government regulation, infrastructure and the promotion of healthy competitions among the existing operators.

5.2 CONCLUSION

From the analysis of result and the test of hypotheses, the study arrived at the conclusion that GSM mobile lines teledensity (GMLTD) has a positive and significant impact on the economic welfare of citizens (EW) at 5% level of significance.

Also, at 5% level of significance, the critical value (Chi-square tabulated) is 9.49 and greater than Chi-square calculated for the entire cross tabulation done except for that of drop balance and the need for improvement where the critical value was less than the Chi square calculated (12.105). It was the only Chi square calculation that rejected our null hypothesis (H_O) and it is just 6.25% of the entire cross tabulation and Chi square done and the detail is shown in Tables 4.34. Since 93.75% of the entire cross tabulation and Chi square done accept the null hypothesis (H_O), we thus conclude that GSM service delivery is poor and inefficient in Nigeria.

The study identified Poor network, Internet and coverage issues, High tariff, Recharge and SMS (text message) issues, Poor customer care service, Poor regulation, infrastructure and competitions as some of the shortcomings of GSM service delivery in Nigeria. We must stand up to our responsibility as individuals, stakeholders, nation and government, if we must make any meaningful progress at the socio-economic fronts. Service delivery must be

taken serious and to the next level to open other economic opportunities to citizens and the business environment as a whole.

5.3 RECOMMENDATIONS

For GSM service delivery to be more efficient and responsive, there must be effective government regulation, commercial management, stakeholders' involvement and healthy competition. Based on the empirical findings of this study and the conclusion thereafter, and the need to provide adequate solution to the issue of poor GSM service delivery in Nigeria, the study made the following recommendations:

I. The GSM operators should make deliberate effort towards improving GSM network, Internet and coverage in Nigeria.

II. The GSM operators should reduce tariff rate on calls and data to be more affordable to subscribers in Nigeria.

III. The operators should make effort towards eliminating the incidence of recharge and SMS (text message) related issues.

IV. The operators should also improve customer care service to be more responsive, prompt and subscribers friendly.

V. Government should intensify and improve regulations through the Nigerian Communication Commission (NCC) to protect and safeguard the interest of subscribers in Nigeria.

VI. Again, infrastructure such as electricity should be improved upon and made more stable as it is a vital factor affecting GSM services production.

VII. Lastly, the government should encourage healthy competitions among the service providers to promote efficiency in the GSM subsector in particular and telecommunication sector in general.

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APPENDICES

APPENDIX A: Complains Against Mobile Lines Operators in Nigeria.

MOBILE LINES OPERATORS	COMPLAINT IN PERCENTAGE (%)
MTN	43%
GLO	33%
CELTEL (NOW AIRTEL)	13%
MULTILINKS	3%
MTEL	3%
RELTEL	2%
NITEL	2%
STARCOMMS	1%
TOTAL	100%

Source: Compiled from Vanguard 22 October 2007, Page 35.

APPENDIX B: Questionnaire for GSM Subscribers.

Dear Respondent,

This questionnaire is purely for academic purpose. It is specifically designed for a Master degree research (M.Sc) programme. I am a postgraduate student of the Department of Economics, Ahmadu Bello University Zaria, conducting a research on the topic **"GSM Coverage in Nigeria and its Impact on the Economic Welfare of Citizen"** Your response shall be treated with utmost sense of responsibility, respect and the highest level of confidentiality. At your discretion, anonymity in terms of individual and institutional identity is guaranteed.
Please, your sincere response is highly solicited, while I thank you most sincerely for your valued co-operation.

QUESTIONNAIRE NO….

SECTION A: PERSONAL INFORMATION
Please indicated by ticking the appropriate answers
1) Age: 18-28Yrs ☐ 29-39Yrs ☐ 40-50Yrs ☐ 51-64Yrs ☐ 65 and above ☐
2) Sex: Male ☐ Female ☐
3) Employment Status: Employed ☐ Unemployed ☐ Students ☐
4) Businessman ☐ Company Staff ☐
5) Level of Education:
Post Graduate ☐ Graduate ☐ NCE or OND ☐ WAEC ☐ Primary School ☐
6) Marital Status: Married ☐ Single ☐ Widow, Widower or Separated ☐

SECTION B: INFORMATION REGARDING YOUR MOBILE LINE

1) What network(s) do you subscribe to?
MTN ☐ Airtel ☐ Glo ☐ Etisalat ☐ M-Tel ☐
2) What is your mobile number? (Optional) ☐
3) For how long have you been using GSM Services?
0- 3years ☐ 4-6 years ☐ 7-9 years ☐ 10 and above ☐
4) How much to you spend on GSM Services monthly on the average?
N1-N2, 000 ☐ N2, 001- N4, 000 ☐ N4, 001 –N6, 000 ☐ N6,001- N8,000 ☐
N8, 001 and above ☐
5) Your mobile line is used mainly for what purpose(s): Busines ☐ Communicatio ☐
Both ☐
6) Are you aware of the existence of Nigeria Communication Commission (NCC) Ye ☐
No ☐
7) If yes, do you think they are they effective regulatory GSM Services? Yes ☐ No ☐

SECTION C: INFORMATION REGARDING GSM EFFICIENCY AND SERVICE DELIVERY.

1) Are you satisfied with GSM services in Nigeria? Yes ☐ No ☐

2) Do you usually experience network issues?

Yes ☐ No ☐

3) Have you experience a sudden reduction in your balance before?

Yes ☐ No ☐

4) In your opinion do think that the tariff on call is high? Yes ☐ No ☐

5) Have you ever been charged for sending an SMS (text message) that was not delivered?

Yes ☐ No ☐

6) Have you ever tried making an urgent call and were not able to connect even with valid airtime on your line? Yes ☐ No ☐

7) Have you experience issues of voice clarity on calls? Yes ☐ No ☐

8) Have you experience a one way speech on dialed call or received call? Yes No ☐

9) ☐ve you experience issues with recharging without prior notice? Yes ☐ No ☐

10) Have you ever been charged for service you didn't subscribe for? Yes ☐ No ☐

11) Have you experience issues of internet connectivity on your line? Yes ☐ No ☐

12) Do you have easy access to the customer care unit? Yes ☐ No ☐

13) If yes, do they attend to you satisfactorily? Yes ☐ No ☐

14) Do you think there is room for improvement in the provision of GSM services? Yes No ☐ ☐

SECTION D: IMPACT ON WELFARE

1) Does GSM promote your economic well being? Yes ☐ No ☐

2) Does GSM affect your income level? Yes ☐ No ☐

3) Does it help to increase your income level? Yes ☐ No ☐

4) Do you generate any form of income as a result of GSM? Yes ☐ No ☐

5) Does GSM promote your business or in any way? Yes ☐ No ☐

6) Does the existence of GSM help you in making better economic decisions? Ye☐ No ☐

7) GSM is necessary for your economic well being and survival? Yes ☐ No ☐

8) GSM has made you better off economically? Yes ☐ No ☐

SECTION E: PROBLEMS, CHALLENGES AND REMEDIES

1) In your opinion what are the short coming of GSM services in Nigeria?

a) ……

b) ……

c) ……

2) What are the challenges facing GSM subscribers in Nigeria?

a) ……

b)……

c)……

3) In your opinion, what can be done to improved GSM services in Nigeria?

a) ……

b)……

c)……

APPENDIX C: Regression Result.

Dependent Variable: EW
Method: Least Squares
Date: 11/14/11 Time: 12:37
Sample(adjusted): 1984 2009
Included observations: 25
Excluded observations: 1 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.253401	3.518439	-1.493106	0.1518
LOG(GFCF(-1))	-1.325143	0.365646	-3.624115	0.0018
LOG(FDI(-1))	0.338322	0.286473	1.180989	0.2522
LOG(TRDOP)	0.039156	0.128500	0.304717	0.7639
GMLTD(-1)	2.930947	1.177199	2.489763	0.0222
DUM	0.758575	0.319511	2.374173	0.0283

R-squared	0.811289	Mean dependent var	0.565695
Adjusted R-squared	0.761628	S.D. dependent var	0.921773
S.E. of regression	0.450040	Akaike info criterion	1.446603
Sum squared resid	3.848187	Schwarz criterion	1.739133
Log likelihood	-12.08254	F-statistic	16.33662
Durbin-Watson stat	1.672363	Prob(F-statistic)	0.000003