

Supplanting Copper:  
Pricing and Quality of GSM Telecom Services in Africa

by

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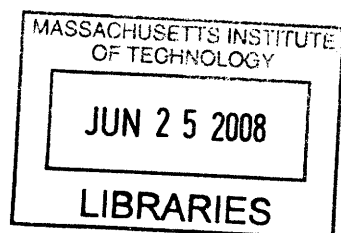
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## **Dedication**

*I would like to dedicate this thesis to my parents Prof. and Dr. (Mrs) Oyelaran-Oyeyinka. Prof. and Mev., this is my way of saying I truly appreciate you. All the love, care, protection, advice, you have given. I know this all would not have been possible without you. I hold you in the highest regard. My God reward you.*

## **Acknowledgement**

“The LORD is my strength and my shield; my heart trusted in Him, and I am helped: therefore my heart greatly rejoiceth; and with my song will I praise Him” Psalm 28v7 (KJV). I would like to thank the Almighty God – Father, Son and Holy Spirit, for being my strength, my song, my support, my shield, my wisdom and my testimony throughout my entire time writing this thesis and at MIT in general. I love You Lord.

I would like to extend my gratitude to my thesis committee, both official and unofficial. In particular my thesis supervisor, Prof. Alice Amsden; my readers, Prof. Cherie Abbanat, Prof. Akintunde Akinwande, Prof. and Dr. Oyelaran-Oyeyinka. This thesis would not have been made possible without your constant direction, feedback, invaluable insights and nudges. I also say a huge thank you to the entire DUSP faculty, staff and students who made my stay at DUSP enriching and fulfilling. The good Lord bless you real good.

I do not fail to remember all those who helped to make the fieldwork for this study possible, including those who carried out the surveys, granted me interviews, and arranged the interviews, both in Nigeria and Kenya. I particularly thank Dr. Nyaki, Mr. Adebowale, Dr. Adebowale, Mr. Ogunmola, Mr. Seun Akinwunmi and the staff of the ICT Village in Kenya.

Finally, I would like to appreciate my family – real and surrogate -, my church family, and all my friends here in DUSP, and beyond, who made life here all the more wonderful, fun and bearable. I appreciate every meal shared, song sang, phone call, text message ... and last minute help. I thank you, I love you all. I appreciate you all. Please keep in touch.

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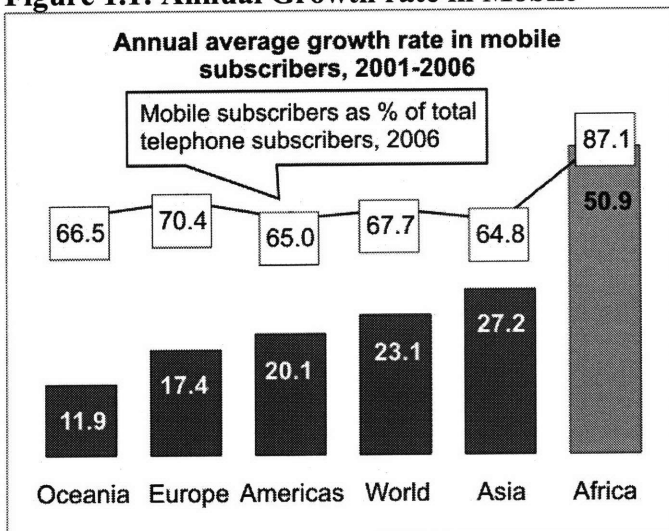
# Chapter One

## 1.0 Introduction

### *The Mobile (Cellular) Phone Revolution*

The mobile phone is one of the greatest innovations of the 20<sup>th</sup> century. It allows a user to communicate information – data and voice – regardless of their geographical location. Its importance has grown tremendously, as people adopt it for use in personal/business uses, disaster mitigation/security and in the improvement of the health and overall welfare of a particular people. Although the world’s first commercial portable cellular phone was only just developed in 1983 by Motorola, yet, in these past 25 years, we have seen a speedy and widespread adoption of the cell phone, first by the developed, and in more recent years, by the developing countries. The growth rates in Africa in particular, have been exponential over the past decade, as seen in fig 1.1.

**Figure 1.1: Annual Growth rate in Mobile**



Source: International Telecommunication Union

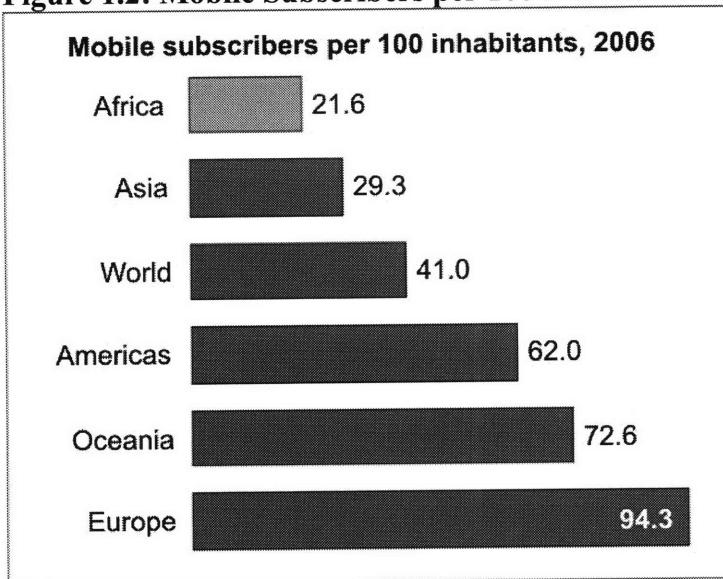
As with other countries, telecommunications in African countries, before the advent and adoption of the cell phone, was largely through fixed telephony. However, fixed line services which were controlled by public monopolies were characterized by high levels of inefficiencies manifesting in both a long waiting period before connection could be made and an expensive call rate. Due to limited access and long waiting periods, African fixed telephony could even be said to have suffered from negative network externality.<sup>1</sup> To this end, while mobile telephony in many other countries have been adopted as a complement to the fixed telephony, in Africa, growth trends show that the mobile phones are acting more as a substitute, than a complement for the fixed line (but that might be changing).<sup>2</sup> In particular, according to statistics by the International Telecommunications Union (ITU), Africa is the only region where more revenues were generated from mobile services, than from fixed line services. Particularly, within the region, the number of fixed telephone subscribers to 100 inhabitants, increased dramatically from 1.9 to 3.2, while that of mobile subscribers increased from 0.2 to 21.6, over the 10-year period from 1996 to 2006, as can be seen in figures 1.2 and 1.3. The title of this thesis, “supplanting copper,” thus hails from this observation of mobile phones taking over from fixed lines, which traditionally are affiliated with their copper line infrastructure.

---

<sup>1</sup> A network effect relates to goods and services which value to a potential customer has proportional benefit that depends on the number of extant users or customers of the goods and services. For this reason, the quantitative numbers of existing adopters, for instance, of a technology or service bear strong relation to the potential adopter. An important outcome of this phenomenon is that the more other individuals adopt the service, the greater the benefit to current users such as users of telephone tend to benefit by reaching more people the greater the number of users. Economists refer to this state of affairs as network externality.

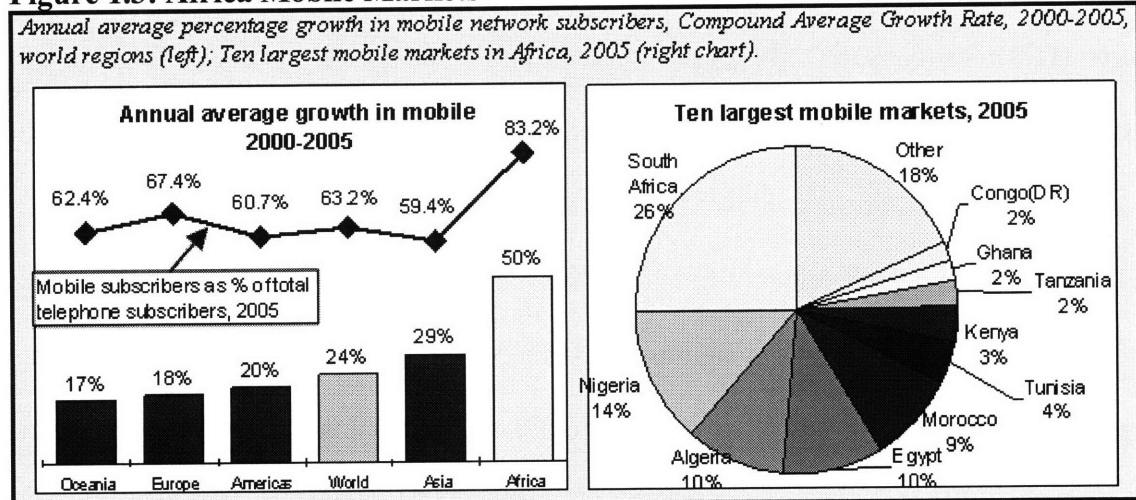
<sup>2</sup> Many African countries have begun to privatize even the fixed telephony. This might lead to greater efficiency in the delivery of fixed telephony.

**Figure 1.2: Mobile Subscribers per 100 Inhabitants**



Source: International Telecommunications Union (2007)

**Figure 1.3: Africa Mobile Markets**



Source: International Telecommunications Union (2006)

Increased growth in the telecommunications sector has been largely attributed to the liberalization of the telecommunications sector, whereas in times past, one single entity, usually a government owned organization, had monopoly over the provision of phone services. This liberalization usually brought a lot of revenue for the government. For instance, we see that the two highest privatization proceeds recorded worldwide, were for the sale of fixed telephony companies, namely NTT Japan for \$70,469 million and



British Telecom in the United Kingdom for \$22,931 million in 1999. Table 1 in the appendix shows all top ten proceeds from this same study. This observed trend of privatization of the telecommunications sector in many developed countries is now observable in many African countries. In the 1990s, many African governments began to sell licenses to private sector providers, for mobile telephony. The sale of these licenses, which permitted private companies to provide telecommunication services, as defined by their countries, have also often resulted in a lot of money for the government. We see this in the particular case of Nigeria, where MTN Nigeria acquired its license in November 2000, for \$285million, while Globacom Nigeria paid US\$150million.

Not only have governments liberalized the telecommunications sector, they have also introduced considerable amount of competition to the sector. Studies have shown that competition has been instrumental in increasing efficiency and driving down prices consumers have to pay for their mobile telephone services. In a particular study of OECD countries, “it was shown that the ending of monopoly brought immediate improvement to mobile subscription penetration. Again, it was noted in the same study, that upon examination of the relationship between mobile market structures and growth in 1995, “it was noted that, in 1994, the average growth in markets with three operators was, on average, three times higher than in markets with monopolies” (OECD, 17, 2000).

While many African countries have witnessed an unprecedented increase in the number of subscribers for mobile telephony, call price, as indicated by price per second or per minute, that the consumer pays, are still relatively high. Conversely, the quality of service

that consumers are receiving, are still low. There has been widespread complaints, particularly in the popular media of African countries on the high prices that consumers have to pay to use their cell phones, and the frequent and persistent poor service they receive. However, there has been no systematic study, which we know of, seeking to understand the reasons for the high call rates and poor quality of cell phone service in Africa. Rather, some might even say prices are decent, compared to the era of fixed telephony. Yet one might ask, because these rates have been reduced since mobile services were first introduced into the market, should we assume that these are the best rates that the African market can offer at the given level of technology? On the face of it, it will seem that consumers are willing to pay but a closer look at the figures show that a large set of the population remains excluded, to some extent, due to their inability to pay for telecoms services. In other words, we need a balance between the need to encourage investment and the problem of providing efficient and equitable service to consumers. Furthermore, because consumers are bearing the service quality at the level it is, should it remain as such? This study thus intends to systematically examine pricing and quality of services in African countries, asking in particular, why prices are still high, and quality of service low, using Nigeria and Kenya as case studies.

The rest of this thesis will be structured as follows. The next section presents the objectives and methodology of this study, going on to address the issues of our premise, about whether prices are really high, and quality of service low; why we would expect anything different from what we currently observe, and why if at all, this research is necessary to be undertaken. The next chapter would be an overview of the

telecommunications sectors of Kenya and Nigeria, which serve as the case studies for this paper. Chapter 4 will then report what was found to be the determinants of price and quality of service, and chapter 5 would provide the conclusions, including policy implications and recommendations, based on our findings.

### **1.1 Research Objectives**

This thesis has four main objectives. These include understanding:

Objective 1: What the determinants of the pricing structure of the telecommunication sector are in Nigeria and Kenya and what factors are responsible for the cost of communication?

Objective 2: What are the policies, institutional and regulatory frameworks for the development of the telecommunication sector in the two countries?

Objective 3: What roles the existing regulatory agencies have played in defining the current cost and pricing structure; and who are those who benefit and who lose from their actions?

Objective 4: What are the implications for the theory of regulation and the state in the way competition, technology and institutional changes have evolved in the two countries?

### **1.2 Methodology**

In order to answer the question of why prices are still high and quality low in Africa, we employ different research instruments to systematically examine the telecommunications industry of two countries, Nigeria and Kenya. The two countries serve as good cases, for a number of reasons. To start with, Nigeria is the most populous African country in the

Western part of the continent, while Kenya is based in Eastern Africa with a huge international presence. Again the two countries are representative of the explosive growth of GSM mobile in the continent. However, we limit the surveys to the two countries due evidently to resource limitation (money and time). While the study of pricing in these two countries may not be enough to draw an overall conclusion for all of Africa, the hope was that our research will enable a better understanding of the telecommunications sector in African countries in general.

To this end, the study employed the use of both quantitative and qualitative measures. In particular, questionnaires were handed out to consumers in both countries (see appendix for details), while interviews were carried out with service providers and experts familiar with the sector in the two countries. We stratified the samples to capture different income groups in the two countries. Questionnaires were administered to 100 and 88 respondents in Nigeria and Kenya respectively.

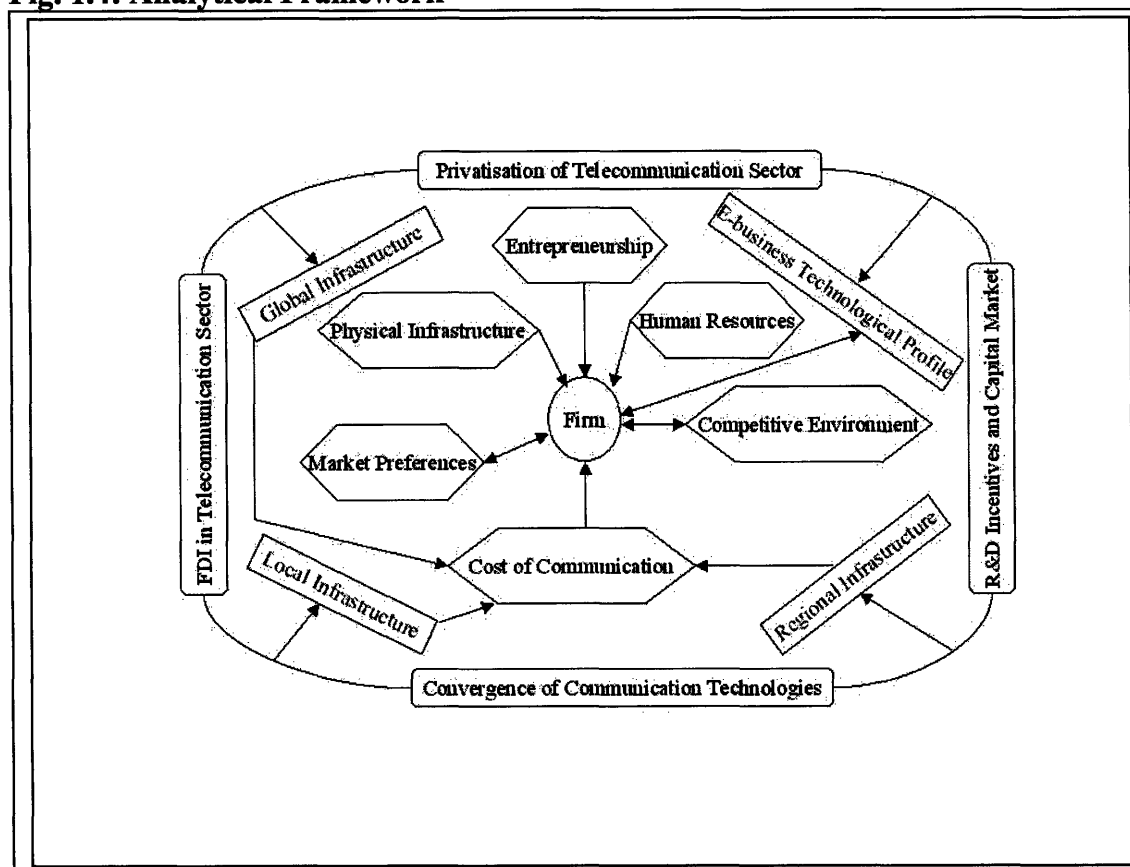
### **1.3 A Basic Framework**

As figure 1.4 shows, a number of factors influence the behavior of enterprises and the growth of telecoms. Prominent in our study are the processes related to Foreign Direct Investment (FDI) in the telecommunications sector coupled with privatization and liberalization which has been influential in Africa's communication network growth. A number of other issues, such as technology convergence and research and development (R&D) incentives, are included in the framework but these are not discussed in this study.

The role of telecommunication and competition policies in the different countries are critical but we discuss them only as they affect the two factors of pricing and quality as a full discussion of the policies is outside the scope of the thesis. Related to liberalization are the impact of the competitive environment (Pratten, 1991), skill of managers, market preferences (Lal, 2004), and cost of communication (Mehta, 2000). However, we limit our discussion to the factors that are external to the telecoms system and the companies such as technological infrastructure and physical infrastructure. We also note that the telecom sector involves different set of actors. These actors include telecommunications service providers, other value added actors (e.g Internet service providers), regulators and of course, the consumers. The costs associated with building telecommunication networks, type of technology, initial fixed cost of network among others are some of the other factors that influence the diffusion of e-business technologies.

Equally important are the speed of information processing systems (servers subsequently) and the capabilities of the information processing servers installed at local, regional, and national level, determine the network speed. For these reasons, the spread and adoption of GSM mobile is as related to economic factors as it is dependent on other technical factors including a reliable high bandwidth communication network, and the right technical human resources. The force of competition, as well, tends to shape the attitude of enterprises to the adoption of innovations, while the level of competitiveness of firms operating in the same product market serves as another factor influencing network growth.

**Fig. 1.4: Analytical Framework**



Note: "Firm" represents telecom companies.

#### 1.4. On Pricing and Quality of Service (QoS)

Prices that consumers face in many African countries differ. We see that most prefer to use prepaid rather than post paid services. There is also the general tendency towards discriminatory pricing and the offering of different packages to consumers, even by and between individual service providers. Moreover, providers tend to innovate along the basis of price. To this end, we observe such offerings as peak/off peak pricing; local/international pricing; pricing that suits individual specific phone usage e.g. for communicating with family and friends vs. business usage. This section analyzes three broad issues with regards to this thesis – Are prices really high, and quality of service

low; why should we expect prices to be lower and quality of service better, and finally, why do we care if prices are high or quality of service low.<sup>3</sup> To put our discussion in context, we measure QoS in telecoms by such key parameters as traffic channel congestion, call completion rates, call set-up success rates, call drop rates, percentage of failed calls, call set up time, speech quality index, and handover success rates.

#### **1.4.1. Are prices really high? Is quality of service low?**

Are GSM prices that consumers in many African countries faced with really high? Conversely, is quality of service that bad? And if the conclusion is that they are high, on what basis are we making a comparison. Furthermore, if indeed the quality of service (QOS) is actually appalling, then what standards are being used to measure QOS? Using Nigeria and Kenya as our focal points, and using cross-country analysis, we see that the tariffs that the service providers are charging for their services are quite high, and that quality of service is low.

#### ***Cross-Country Comparison of Prices***

Not only is the price that consumers have to pay for their mobile services perceived to be high and the quality of service low by the very consumers that are using these services, when compared to other countries in the world – developed and some developing – we observe that prices in many African countries are high and quality of service low. While consumers perception survey in this study has indicated this clearly (see chapter 3), the

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<sup>3</sup> While there are many prices that can be looked at, in this study, analysis shall be limited to prices that consumers have to pay to make calls, within the same networks, other networks, fixed lines, SMS costs, at both peak and off-peak period. To this end, such costs as that of international calls, additional services, roaming prices, while interesting to also observe, are excluded from primary analysis in this study.

basket of prices computed by the ITU confirms this trend in table 1.1 and figure 1.5 below. We see in particular that prices for the mobile basket, are higher in the select Sub-Saharan African countries than in their Asian counterparts, which proved to be the lowest, themselves also developing countries.<sup>4</sup> Why? The South African mobile call rate (13.3) for instance despite the relatively higher per capita income of this country is higher than that of countries such as Nigeria and Tanzania (10.6 and 9.5 respectively). The high telecom cost in South Africa is attributed largely to limited competition and monopolistic behavior of the dominant service provider, see Table 1.1.<sup>5</sup>

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<sup>4</sup> For the mobile basket, of the 17 countries, costs in Brazil were the highest, followed by Kenya, Korea, United Kingdom, South Africa, Turkey, Nigeria, Colombia, Tanzania, Jordan, Sweden, Philippine, the United States, and Malaysia. China, Bangladesh and India spotted the lowest three countries, respectively.

<sup>5</sup> *Price basket for residential fixed line* is calculated as one-fifth of the installation charge, the monthly subscription charge, and the cost of local calls (15 peak and 15 off-peak calls of three minutes each). *Price basket for mobile* is calculated as the pre-paid price for 25 calls per month spread over the same mobile network, other mobile networks, and mobile to fixed calls and during peak, off-peak, and weekend times. It also includes 30 text messages per month. *Cost of call to U.S.* is the cost of a three-minute, peak rate, fixed-line call from the country to the United States.



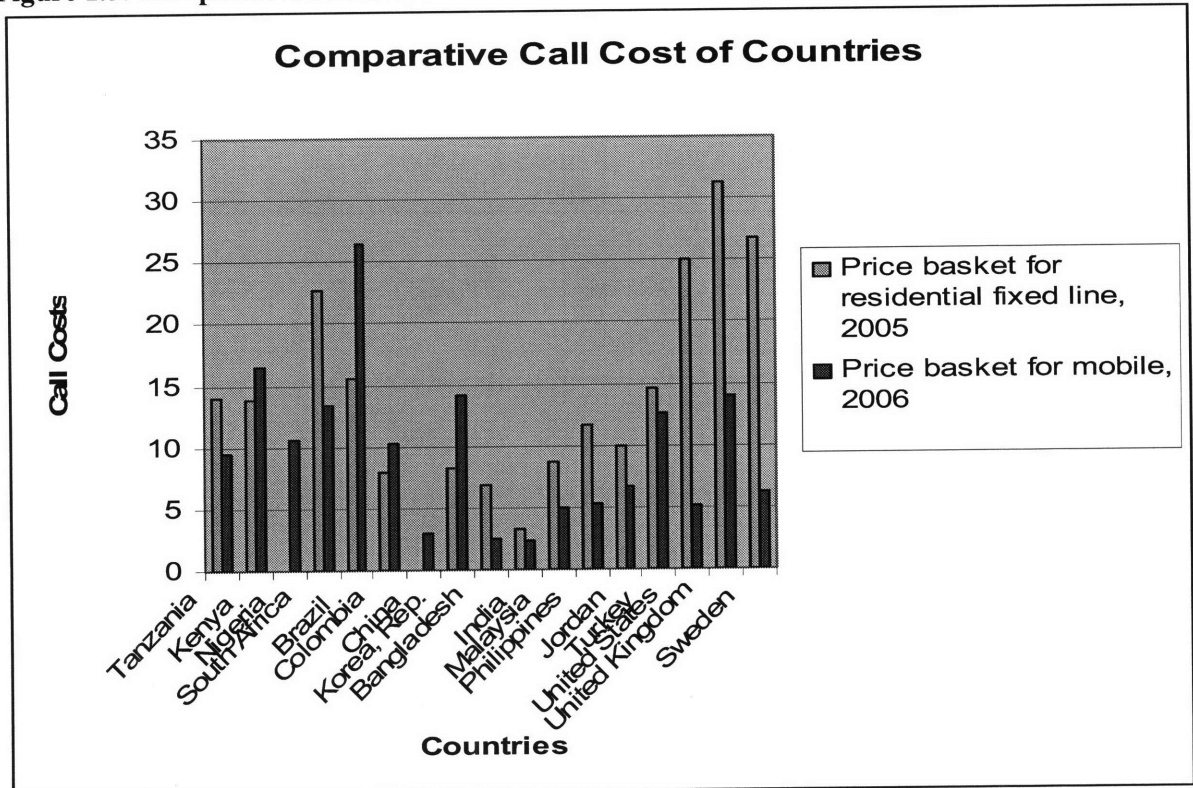
**Table 1.1: Comparative Call Cost of Countries<sup>6</sup>**

Region	Country	Price basket for residential fixed line, 2005	Price basket for mobile, 2006	Cost of call to U.S. \$ per 3 minutes, 2005	GDP per capita, \$, 2005	Fixed mainlines, 2005	Mobile subscribers, 2005	Internet users, 2005
SS. Africa	Tanzania	14	9.5	3.17	330	4	52	9
SS. Africa	Kenya	13.9	16.5	3	442	8	135	32
SS. Africa	Nigeria	-	10.6	1.49	459	9	141	38
SS. Africa	South Africa	22.7	13.3	0.79	3,406	101	724	109
LAC	Brazil	15.6	26.5	0.71	3,597	230	462	195
LAC	Colombia	8	10.2	-	2,714	168	479	104
East Asia	China	-	2.9	2.9	1,449	269	302	85
East Asia	Korea, Rep.	8.3	14.2	0.76	13,210	492	794	684
South Asia	Bangladesh	6.9	2.5	2.02	433	8	63	3
South Asia	India	3.3	2.4	1.19	588	45	82	55
South East Asia	Malaysia	8.7	5	0.71	4,437	172	771	435
South East Asia	Philippines	11.6	5.3	1.2s	1,129	41	419	54
West Asia	Jordan	10	6.7	1.44	2,086	119	304	118
West Asia	Turkey	14.7	12.6	2.4	3,417	263	605	222
North America	United States	25	5.2	-	37,267	606	680	630
Europe	United Kingdom	31.3	14	0.77	26,891	528	1,088	473
Europe	Sweden	26.7	6.2	0.41	29,954	717	935	764

Source 1: The World Bank, World Development Indicators, 2007. Data on telecommunications are from the International Telecommunication Union's World Telecommunication Development Report database and World Bank estimates. GNI per capita are estimated by World Bank based on national accounts data collected by World Bank.

<sup>6</sup> Later on in this study, tables and figures would be generated from this cross-country table. The source is the same, and would be referred to as "Source 1."

Figure 1.5: Comparative Fixed and Mobile Call Costs of Select Countries



Source 1

### **Box 1.2. Limited Competition and High Prices in South African Telecom**

The South African telecom display high price structure in part because there has been no true competition in the South African market for voice and broadband products. Competition is currently limited by three main factors:

- Monopoly behaviour over the international connection, including anti-competitive pricing;
- The effective prevention of facilities based competition;
- The entrenched position of the dominant player, Telkom. This has led to very high prices for broadband connectivity (see below).

The vast majority of potential consumers in the country cannot afford an Internet connection, let alone broadband connectivity. As a direct consequence, South Africa is lagging significantly, both in terms of general Internet penetration and specifically in Broadband penetration.

Government initially intended to bring about competition for Telkom through the licensing of a Second Network Operator (SNO), and this was to come into effect as soon as Telkom's legislated protection period ended in 2001. However, a drawn out process by the Department of Communications, combined with a downturn in the global telecommunications market in 2001-2002 resulted in no significant global telecommunications company expressing interest in being a strategic equity partner for the SNO. This changed only in 2005 when VSNL of India became the strategic equity partner.

The SNO is poised to provide competition to Telkom in voice calls and Internet access. Price decreases are however likely to be limited to the corporate market rather than the home market. This is because the SNO has to rely on Telkom's network while it rolls out its own infrastructure, and has therefore pay Telkom wholesale prices. If the SNO were to use Telkom's last mile infrastructure it would not be able to offer competitive services. Access to the SAT-3 cable will also be very important if the SNO is to be competitive with Telkom's offerings. Until now only Telkom has had access to the cable for outgoing traffic, which is vastly under-utilised. Government seems to be keen to open up access to the cable to other providers, but as yet there is no resolution on this issue.

It is therefore very likely that Telkom will dominate both the voice and Internet telecommunications market for a number of years [Hodge 2003]. They have had the advantage of being the monopoly in South Africa. Telkom has had a very long period to build up their reserves and prepare for the advent of an SNO. Certainly the price of Telkom shares have risen dramatically since its IPO in response to high levels of profit and the expectation that this will continue.

Source: Fransman (2006)

#### **1.4.2. Why do we expect prices to be lower and QoS to be better?**

Haven established the comparatively high level of prices for the mobile phones (where the specific cases of Nigeria and Kenya would be analyzed in chapter 3), this next section address why we expect lower prices and QoS in African countries.

##### ***Theory of competition and Institution of Regulation***

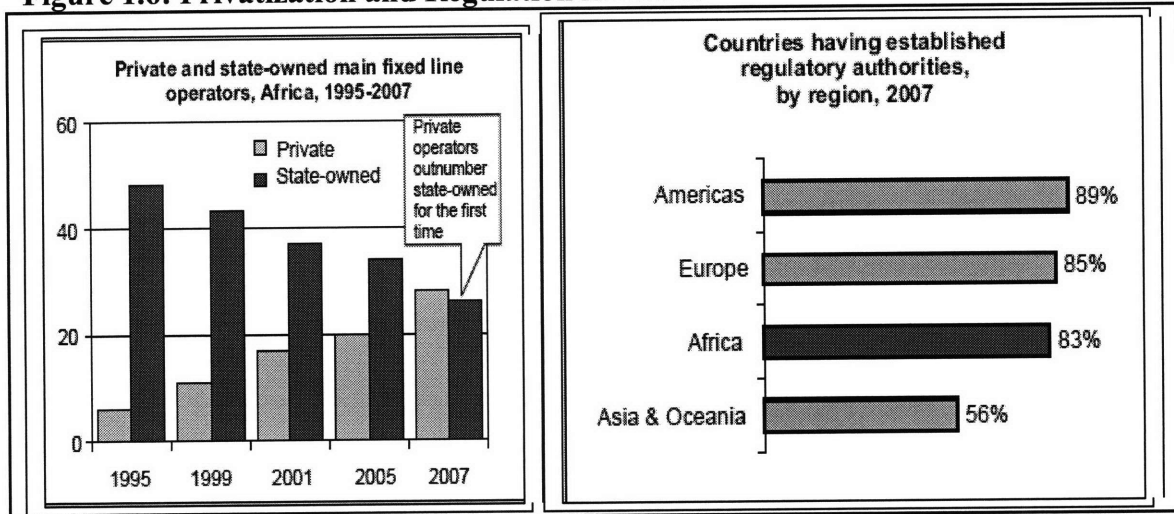
Regulation plays a significant role in national telecoms; given it has the structure of the markets that usually have big multinational companies (MNCs), with natural propensity to monopolistic behavior. Other reasons include the fact that the industry is characterized by very high fixed costs and very low marginal costs. High investment costs ordinarily translate to high fixed costs that are necessary for establishing fully functional telecoms networks. Survival in a high fixed costs industry requires that a network realizes significant economies of scale, and for this reason very few, or in the extreme case only one competitor is likely to survive (Fransman, 2006).

Regulatory regimes in the early phases of the GSM tended to create a quasi monopoly situation for operators to allow them recoup their investment before opening up the market for more competitors. This is because under strong competitive pressures (price will tend towards the marginal cost) that give rise to low prices – with subsequent low revenues – some telecoms network operators are likely to face difficulties recouping their investment costs. This is one of the reasons that regulation assumes an important role

particularly in nascent and emerging telecom markets where high fixed costs and very low marginal costs are the norm.

In the African context, with specific reference to the telecommunications industry and using cases from Kenya and Nigeria, it is evident that government regulation played positive roles, first in arbitrating the liberalization of the telecommunications market, and then in setting up regulatory mechanisms to promote competition and quality services. For instance, the institutionalization of regulatory functions in Nigeria through the setting up the Nigerian Communication Commission (NCC), which serves as regulator, has been widely applauded both in Nigeria and outside. Of course the observed participation of the government in the telecommunications sector is not unique to only Nigeria. From figure 1.6, we see that by 2007, the number of privately owned main fixed line operators in Africa, superseded those that were state-owned for the first time. Again, by 2007, over 83% of countries in Africa had regulatory authorities within the telecommunications industry. These statistics show the types of roles that states in Africa could play such as the decision to liberalize the market while it arbitrate in a significant way the working of the market through regulation.

**Figure 1.6: Privatization and Regulation in Africa**



Source: International Communication Union (2007)

The institutional environment of regulation is for this reason extremely important. Institutions, which are the formal and informal rules that govern human relations, do play an important role in regulation. The relevance of cultural, economic, legal, political and social institutions for the effective operation of markets (which include telecoms markets) has however been a matter of continuous debate (Wade, 1990; Amsden, 2007; Rodrik, 2007). However, while some view the market itself as an institution, other scholars argue that both markets and states are akin to abstract creations, and are in reality social constructs (Chang, 1994), which are mediated by institutions.

More clearly put though, effective legal institutions for instance, are not only necessary in and of themselves, they also need enforcement mechanisms. That is, the effectiveness of the state in mediating between the different telecoms players, will reflect in its ability not only to recognize the right kind of rules, but also how well it can ensure transparency in the application of the rules. This might well be where most developing African

governments failed and where for a change, the telecoms liberalization has recorded an unprecedented success. In other words, the context in which the market economy works, is dependent on the institutional setting in which different entities such as the telecoms firms function.

There seems to be a positive relationship between the liberalization of the market and subscription growth rates. Presently, Nigeria has 4 main GSM providers, and more upcoming CDMA providers. Kenya has 2 main GSM providers, the government owned company, which might soon become a GSM provider. Among these two established companies in Kenya, there is a considerable level of competition. The correlation between competition and efficiency is not a new one. In particular, competition within the telecommunications industry is one that has been studied in countries, which rolled out GSM services earlier than their African counterparts did.

“The OECD [for instance] last examined the relationship between mobile market structures and growth in 1995. At this time it was noted that, in 1994, the average growth in markets with three operators was, on average, three times higher than in markets with monopolies. The performance of duopolies fell roughly in-between” (OECD, 17, 2000).

Now, this study assumes that the companies within the African telecommunications market are working independent of one another, which is a major reason why lower prices and better service of quality is expected. However, if it is the case that there is collusion between the companies and there is indeed an oligopolistic arrangement between the GSM providers, then perhaps we cannot expect prices to be much lower than they already are. Again, the incentives to make quality of service better for each individual firm might be much lower than if there was perfect competition between the

firms. That said, one can also conclude that the characteristic of the telecommunications industry, as with any other industry, would depend to a large extent on the role, if any, that the government plays in it.

### ***Regulation by the government***

Another reason why consumers are expectant lower prices and higher quality of service, is the premise that effective regulation will naturally result in fair prices and good QoS. In both Kenya and Nigeria, there exist regulatory bodies for the telecommunications industry. It can be assumed that the mandate of the regulator – whether it is to look out for the interest of the consumer, or ensure that the service providers have a favorable environment to function within the individual country, or both – and its efficiency in fulfilling this mandate, would largely affect the pricing structure and the quality of service the consumer is faced with. Again, as network grows and companies begin to benefit from economies of scale externality, consumers should be paying less for calls, even as their service providers are declaring huge profits.

#### **1.4.3. Why should we care for lower prices and higher quality of service?**

This section provides some reasons behind the relevance of this study.

### ***Meet demand and extend affordability to a wider range of consumers***

One reason why there is great need for prices to be lower for cell phone services, and for QoS to be better, is to enable greater affordability to a wider range of consumers. A 2004 study found that the degree of responsiveness of demand for mobile phones, with respect



to its price i.e. mobile phones own price elasticity, was -1.5, showing that the demand is elastic.<sup>7</sup> That is an increase in the price of mobile phones, would lead to a fall in the demand for it. Now, one can deduce that the longer prices remain high, and QoS remains low the greater the limitations that people are facing before they can benefit from the vast benefits good and efficient communication attracts. Such benefits include interaction with friends and family, communication within the business sphere and carrying out of business transactions, less time and energy spent in commuting between places when the mobile phone can act as a substitute for such activities. Other benefits of the mobile phone including its usage within the health sector, disaster prone areas.

Again, a New York Times article recorded that access to a cell phone has immense benefits for those in the informal sector, for the cell phone gives them a fixed identity spot where they can be reached, irrespective of the geographical location where they are. It also helps them to save time even as they accept temporary job positions. The article records that:

“Having a call-back number, Chipchase likes to say, is having a fixed identity point, which, inside of populations that are constantly on the move — displaced by war, floods, drought or faltering economies — can be immensely valuable both as a means of keeping in touch with home communities and as a business tool. Over several years, his research team has spoken to rickshaw drivers, prostitutes, shopkeepers, day laborers and farmers, and all of them say more or less the same thing: their income gets a big boost when they have access to a cellphone. (New York Times, April 13<sup>th</sup>, 2008)”

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<sup>7</sup> Price elasticity is an economic term which measures the degree of responsiveness of a good to its own price. A good which is highly price elastic, is one which shows a greater degree of responsiveness to a change in price, while one which is less price elastic, will show a low degree of responsiveness to a change in its own price. An example of such a highly elastic good for instance in transportation, would be one already considered by consumers as a luxury which would include Ferraris, Lamborghinis; while a less elastic one would be one which is considered an absolute necessity, for example taking the bus to work, especially when there are no other means of transportation available.

### ***Contribution to GDP***

Investment in telecom has become crucial in increasing contribution to country's wealth. As one analyst noted, "Apparently, an increase in tele-density could stimulate economic growth, because telecommunications is an important determinant of economic productivity (Atsushi Iimi, 6). World Bank research also suggests that the internal rate of revenue generated by telecoms investment in developing countries of about 20%. Furthermore, we observe that the telecommunications sector attracts a lot of foreign direct investment (FDIs) for a country.

One specific, and oft quoted example is that of the Indian fishermen, off the coast of Kerala in southern India. Robert Jensen, an economics professor at Harvard University, tracked these fishermen, and found that when they invested in cell phones and started using them to call around to prospective buyers before they even got their catch (fish) to shore, their profits went up by an average of 8 percent. Concurrently, consumer prices in the local marketplace went down by 4 percent. A 2005 London Business School study extrapolated the economic effect that the mobile phone brings even further, by concluding that for every additional 10 mobile phones per 100 people, a country's G.D.P. rises by 0.5 percent. (New York Times, April 13<sup>th</sup>, 2008)

### ***Encourage industry innovations***

Within the brief period of time that mobile technology has been deployed in developing countries, including Africa, the world has observed a tremendous level of innovation, as developing countries work to adapt these existing technologies to suit their specific

needs. Aptly put by Hayaatun Sillem, Manager of International Affairs, at the Royal Academy of Engineering in the UK, “African use of mobile phones has been far more innovative than in Europe, largely because meeting the specific needs of Africa requires innovation” (Africa, Global Innovation Report Outlook, 26). To this end, we have seen such ground breaking innovations such as the use of cell phones by farmers to check market prices for their goods, and for the transfer of money among citizens through such innovations as M-PESA in Kenya<sup>8</sup>, Wizzit in South Africa, and Gcash in the Philippines.

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<sup>8</sup> M-PESA is a financial initiative by the service provider Safaricom in Kenya. Safaricom being a subsidiary of the international company Vodafone. M-PESA is a way to carry out money transactions on the mobile phone, without the use of either a bank account or a bank card. With M-PESA, one can deposit, withdraw and transfer money within Kenya by use of the mobile phones. Given the fact that only about 9.8% of Kenyans have a bank account,<sup>□</sup> this innovation by Safaricom shows how a player within the telecommunication industry is adapting to meet specific socio-economic needs such as a large low income population and inadequacies in banking sector for sending money. M-PESA added 200,000 new customers within the 1<sup>st</sup> month, and within one year, it has 1.6 million subscribers. Now, Vodafone is looking to open mobile-banking enterprises in a number of other countries (New York Times, April 13<sup>th</sup>, 2008)

## **Chapter Two**

### **Evolution of Policies and Institutions in Kenya and Nigeria**

This chapter analyzes the evolution and policies of the telecommunications industry in Kenya and Nigeria. As with most countries, these two countries, formerly dominated by monopolistic central government owned telecom providers, have recently liberalized the sector, to allow private sector provision.

#### **2.1. Evolution of Policies and Institutions in Kenya**

In terms of Information Communication Technology (ICT), Kenya is seen to be at the forefront of development and change in Eastern Africa. The Kenyan government is dedicated to making Kenya a regional and attractive hub for ICTs, while the telecommunications companies continually gain international recognition with their innovations. As with other developing countries, Kenya has seen a tremendous increase in the number of telephone subscriptions, over the past years, going from a mobile subscription of 23,000 in 1995, to 1,187,100 in 2002 and 11,440,100 in 2007. In 2002 and 2007, this mobile subscription represented 78.7% and 97.7% of total telephone subscriptions respectively.<sup>9</sup>

The Kenyan government's economic reform initiatives emphasized private sector participation in order to transform Kenya into a modern market-oriented economy. The aim being to improve the economic well-being of Kenyans by establishing Kenya, in the medium term, as the centre of industrial and financial activities in the region (GoK, 9<sup>th</sup>

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<sup>9</sup> Tables 3 and 4 in the appendix, gives remaining statistics for both fixed and mobile subscriptions for Kenya and Nigeria between 1995 and 2007, from the International Telecommunications Union (ITU).

National Development Plan, 2002 to 2008). Policy reform in the telecommunications sector is part of the broader ICT policy and strategy framework. The Government's objective for the communications sector was aimed at ensuring the availability of efficient, reliable and affordable communication and Government services throughout the country. The communications sector policy, provides a framework for the provision of telecommunications and postal services, although there are several challenges (ATPS, 2005). The challenges identified by the sector framework include:

- Weak infrastructure for telecommunications and e-commerce
- High cost / poor pricing structure of information technology and telecommunications
- Small market size of Internet users
- The digital divide within the country
- Lack of awareness and education on ICTs
- Less developed financial infrastructure to support investments
- Inefficient and non-technologically adept legal system
- Socio-economic and psychological factors (lack of trust, resistance to change, generation and economic gaps)

Nevertheless, Kenya a country in East Africa, with a population of approximately 37 million has experienced considerable growth in telecoms. Also, like Nigeria, it had a central government owned telecom provider called Telkom Kenya until the 30<sup>th</sup> of June, 2004. Telkom Kenya was still a wholly Government owned organization until pressures mounted to undertake economy-wide reforms forcing the government to divest from Telkom Kenya. Telkom still has monopoly over local and long distance telecommunications services, exchanges, international services and public payphone services for a finite period. It was licensed to operate the public switched telephone

network [PSTN] and the public switched data network [PSDN] for the period of exclusivity up to 30<sup>th</sup> June 2004.

In the mobile cellular market, the two providers of mobile services in Kenya are Safaricom Limited, and Celtel Kenya. Safaricom is a joint venture between the government-owned Telkom Kenya, and the British owned telecommunications company, Vodafone, which got its license in 1997. Telkom Kenya owns 60% of Safaricom, while Vodafone owns 40%. Celtel Kenya, formerly KenCell Communications Limited is one of the leading telecommunications service providers in Africa. Celtel International provides services not only in Kenya, but in other countries including Nigeria, Uganda, and Tanzania. KenCell Communications Limited – who originally bought the second license in Kenya, was a joint venture between Sameer Investment Group, which is a locally incorporated company, and Vivendi International of France – was licensed on 28<sup>th</sup> of January 1999, and started operations in August 2000. Celtel International then bought 60% of the shares owned by Vivendi in KenCell Communications Limited, and changed its name to Celtel Kenya Limited (CKL). To the chagrin of the current service providers, there have been allusions to the fact the Telkom Kenya, the government owned company, is also seeking to provide mobile services.<sup>10</sup>

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<sup>10</sup> In an interview with Corporate Kenya, the CEO of Safaricom expressed that Telkom Kenya does not have the license to roll out mobile services, and if it does roll out this service, it would be done illegally or irregularly. He also conveyed the fact that Telkom did not pay the \$55 million upfront license fee, nor the fees for frequencies, revenues and excise tax on airtime revenue. Finally, he expressed that Telkom Kenya rolling out mobile services would signify their competing against their subsidiary, which is against the shareholder's agreement (Corporate Kenya, 2007/2008).

Historically, the telecommunications sector in Kenya, was regulated through the former Kenya Posts and Telecommunication. However, *The Kenya Communications Act of 1998*, provided the legal and regulatory framework for the communications sector for Kenya. This Act established Telkom Kenya Limited, as a public telecommunications operator and issued it licenses in all the areas it was then operating. The Communications Commission of Kenya (CCK), was also established as the government agency to licence and regulate or to oversee the activities of investors with interests in the telecommunications, radio-communications and postal services sector (ATPs, 78). In particular, CCK was mandated to carry out the following major functions namely; licensing (telecoms and postal/courier) operators; regulating tariffs; establishing interconnection principles between operators; type-approval of communications equipment; managing the radio frequency spectrum; formulating telecommunication numbering schemes and assigning them to network operators; and implementing Universal Service Obligation for both postal and telecommunication services. Thus, the mandate of Kenya's regulatory body, CCK extends even beyond the telecommunications sector.

In a review of the telecommunications sector of some African countries, by the African Technology Policy Studies (ATPs), they highlight five major aspects stressed in the Kenya Communication Act of 1998. These include to:

1. Promote universal and affordable provision of telecommunication services
2. Encourage ownership and control of telecommunication services by Kenyans
3. Encourage investment and innovation in the telecommunication industry

4. Encourage the development of a competitive and effective telecommunications services and supply sectors
5. Ensure fair competition within the telecommunication industry

According to the ATPs study this communication policy, recognizes the importance of having an efficient and affordable telecommunication system. It is therefore not surprising that we begin to observe a rapid growth in the telecommunications sector in Kenya during this time. In addition to creating the CCK as the regulatory body, Kenya also opened up the telecommunication sector to private sector provision in 1999. To this end, there are now two main GSM providers in the sector. While there has been considerable increase in the number of people who now have access to communication in Kenya, it is speculated that the sector could be even more efficient, if a third operator is introduced into the market, and mobile phone taxes are reduced (Corporate Kenya 2007/2008, 185).

## **2.2. Evolution of Policies and Institutions in Nigeria**

Nigeria, the most populous Africa, with its over 130 million inhabitants, was the only African country to make it to the top 10 countries boasting fast telecoms growth in 2006<sup>11</sup>. In the mobile cellular sector, there has been tremendous increase in subscription. We see an exponential growth in subscription from 13,000 to 1,569,000 to 40,395,600 in 1995, 2002 and 2007 respectively. Figure 2.1 below shows the growth in the telecom sector in Nigeria between 2004 and 2007. Now the telecommunication operators are

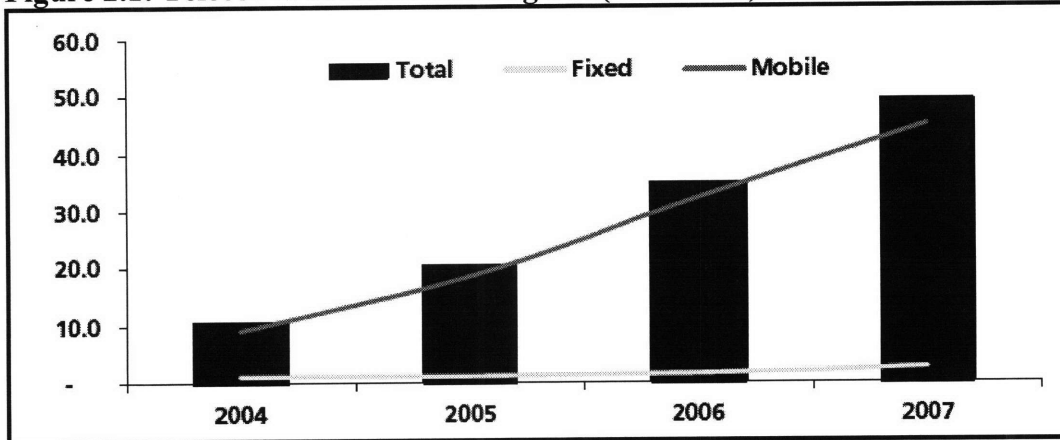
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<sup>11</sup> The complete rankings are as follows India (1), China (2), Pakistan (3), Russia (4), Indonesia (5), Ukraine (6), Brazil (7), Bangladesh (8), Nigeria (9) and Vietnam (10)



estimated to have employed close to 2000 persons, with 400,000 others which may be directly benefiting from the indirect employment.

**Figure 2.1: Telecom Subscribers in Nigeria (2004-2007)**



Source: Afrinvest Research

Until 1986, a publicly owned company called the Nigerian Telecommunications Limited (NITEL) was entrusted with overseeing the development of the telecommunications industry, when it was commercialized.

The institutions involved in ICT regulation in Nigeria are as follows<sup>12</sup>:

1. The Nigerian Communications Commission (NCC);
2. The Nigerian Broadcasting Communications Commission (NBC);
3. The National Information Technology Development Agency (NITDA);
4. The Political institutions (The Executive, the Legislature, and the Judiciary; and,
5. Private sector ICT Interest Groups

According to the aforementioned ATPS (2005) study, the key responsibilities often carried out by a regulatory institution, were highlighted to include the following:

- i) License allocation, emphasizing transparency of process. This also includes the development of performance targets for operators.

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<sup>12</sup> ATPS (2005, 135)

- ii) Issuing of tariffs guidelines, approval of tariffs and interconnection fees.
- iii) Creation of a stable and predictable environment for both investors and customers.
- iv) Ensuring human resource development goals and addressing gender and disability issues.
- v) Numbering and adherence to standards.
- vi) Allocation and management of radio frequency spectrum.
- vii) Promotion and monitoring of free and fair competition – this means ensuring a level playing field and mediation of disputes between stakeholders, especially in controlling the abuse of dominance.
- viii) Consumer protection, including ensuring a seamless national network and furtherance of universal service objectives.

The Nigerian Communications Commission (NCC), is the independent National Regulatory Authority for the telecommunications industry. It is charged with creating an enabling environment for competition among operators in the industry, as well as ensuring the provision of qualitative and efficient telecommunications services throughout the country (NCC website, May 2008). The NCC was established by *Decree 75 of 1992*. In July 2003, *the Nigerian Communications Act in July 2003* was established, and it repealed both the act of 1992, and its amendment decree of December 30<sup>th</sup>, 1998. The Act was consistent with world wide standards of the telecommunications industry, and granted more powers to the NCC to perform its regulatory role adequately. In fact, the new communication Act gave absolute independence to the NCC in making telecommunications industry regulation (ATPS, 129)<sup>13</sup>.

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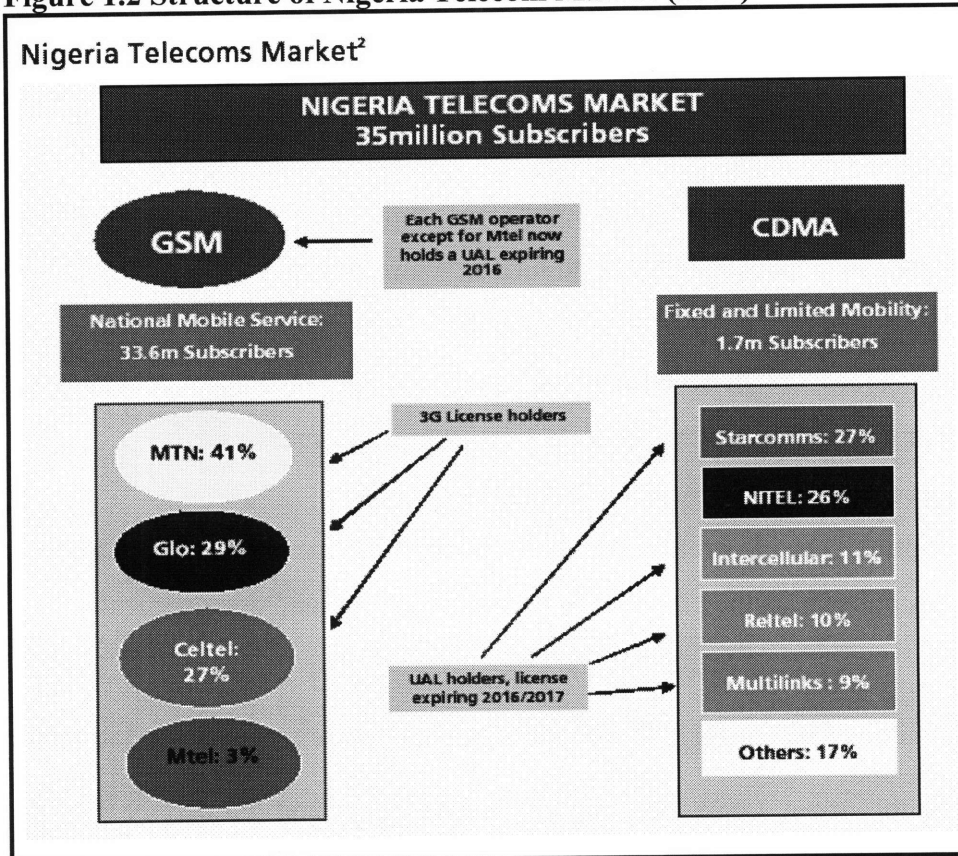
<sup>13</sup> Nigeria's NCC is reputed in Africa as a foremost Telecom regulatory agency in Africa (NCC website, May 2008). Nigeria's regulatory structure differs a little from a country like India, where the governmental Department of Telecommunications (DOT) is in charge of licensing, while the regulatory body – The Regulatory Authority of India (TRIA) – is in charge of tariffs.

Reform in the telecommunications sector in Nigeria, according to CEO of CCK, Ernest NDUKWE are driven by the following factors, at a presentation given in July 2005:

- The inability of governments to continue funding public enterprises, due to dwindling resources
- The need to ensure affordable access to services while creating the conditions for the development of the information and infrastructure needed to improve operational efficiencies in all aspects/sectors of the economy
- The need to attract foreign investment and reduce the role of the government where the private sector has the capabilities to operate more efficiently
- The success of market reform in the developed world
- The prescription of market reform by the multilateral financial institutions to the developing countries as the panacea for economic growth and development

Nigeria's telecommunications sector, can be said to be very vibrant. As seen in the figure below, there are four main GSM providers, 5 major fixed and limited or CDMA providers, and numerous small ones. In terms of the GSM providers, the main providers are MTN Nigeria, Globacom, Celtel Nigeria and Mtel. MTN Nigeria is a unit of the MTN Group, a South African company. MTN itself provides services in about 20 other African and Middle Eastern countries like Afghanistan, Benin, Botswana, and Ghana. MTN was one of the first companies to acquire its license to roll out GSM services in Nigeria, obtaining its license in 2000, and paying \$285 million for the license. As at October 2006, the MTN group held an 81.87% stake in the company. In the first half of 2007, Nigeria, a part of MTN's West & Central African (WECA) operations, made revenues, which accounted to 64.1% of WECA's total revenues, while WECA made up 44% of the MTN group's total revenue.

**Figure 1.2 Structure of Nigeria Telecom Market (2006)**



Source: Afrivest (West Africa) Limited (2006)

Globacom (Glo) is an all nationally owned private company, its owner being the business tycoon and Nigerian citizen Dr. Wale Adenuga. It is also the second national carrier, the first being government owned Nitel. Since it acquired its license in August 2002, for which it paid \$150 million, Glo has been seen as an innovation driven company. Apart from leading the introduction of per second billing (PSB) to the Nigerian market, Globacom's other innovations include enabling Nigerians to do Internet browsing, sending and receiving electronic mails, multimedia messaging, vehicle tracking, mobile

banking and accessing Microsoft Outlook, all on their handsets<sup>14</sup> (Remmy Nweke, *bizcommunity*, April 2008). Glo has also enjoyed a rapidly increasing subscriber's base since it started rolling out telecom services.

Celtel Nigeria is another service provider in Nigeria. It is owned by Celtel International, the overseas and pan-African operating arm of Kuwait's MTC group, after buying a 65% stake from the former owner Vmobile, at the cost of \$1.005bn. The transaction was viewed as the largest telecom deal to date in Nigeria.<sup>15</sup> MTC via Celtel, also has a presence in 15 countries in Africa (Business Monitor International, October 2007). Celtel has in the past years chosen to differentiate itself along the basis of price, and by taking advantage of its continental presence. In Nigeria, Celtel introduced the "Unity Tariffs," whereby calls are made to other networks at the same rate as that within the Celtel network. Again, Celtel has introduced the "One Network" concept, which is a borderless pricing scheme involving 12 countries where it operates. In this scheme, consumers can make calls, send sms' and buy recharge cards, at local rates regardless of the country they in. This innovation won Celtel the "Best new product/service launch" at the 2007 Marketing Society of Kenya Warrior Awards gala (Safaricom's M-PESA service being the first runner up). Countries to which this scheme has been extended include Burkina Faso, Chad, the Democratic Republic of Congo, Gabon, Kenya, Malawi, Niger, Nigeria, Tanzania and Uganda.

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<sup>14</sup> This observation about Globacom's innovations, was made by Mr. Martin Olowonihi, acting chief operating, speaking during the launch of Glo's Optic Fibre Cable backbone at Owerri, capital of Imo State in Nigeria

<sup>15</sup> Vmobile had begun operations on August 6, 2001, and was owned by Econet Wireless Nigeria and traded under Vee Networks. The company claimed that all investors were Nigeria based, and included the state governments of Lagos, Delta and Akwa Ibom. (Source: <http://en.wikipedia.org/wiki/V-Mobile>)

Nigeria Mobile Telecommunications (Mtel), is the fourth GSM provider in Nigeria and is 100% owned by the government telecommunications company, Nitel. Mtel owns the smallest share of the GSM market, as at May 2008, and had even seen reduction in its subscription over time.

Overall, the Nigerian telecommunications industry is seen as a very vibrant and promising one. However, it still suffers from such issues as bad quality of service, and tariffs and universal availability could be improved. Box 2.1 presents an analysis by Business Monitor International in October 2007, which adequately summarizes the strengths, weaknesses, opportunities and threats (SWOT) of the Nigerian telecom industry.

### **Box 2.1: Nigeria Telecommunications Industry Swot Analysis**

- |                      |   |
|----------------------|---|
| <b>Strengths</b>     | <ul style="list-style-type: none"><li>● Competition in fixed-line market is having a positive effect, with the PTOs (regional fixed-wireless operators) driving market growth and stealing market share from incumbent Nitel</li><li>● Growth of mobile sector remains robust, with a fifth foreign-managed company to rival existing operators, MTN Nigeria, Globacom, Celtel and M-Tel</li><li>● Competition and regulatory measures have helped bring down prices in the mobile sector</li></ul> |
| <b>Weaknesses</b>    | <ul style="list-style-type: none"><li>● Despite strong growth in the mobile market, network quality is still very poor and could hamper further sustained growth</li><li>● Rapid subscriber growth has put downward pressure on ARPU rates</li><li>● M-Tel has suffered from huge customer losses due to frequent service outages and a poor public image</li></ul>   |
| <b>Opportunities</b> | <ul style="list-style-type: none"><li>● NCC has announced plans to increase investment in the whole industry, especially in rural fixed-line telephony and data revenue segments.</li><li>● As local operators realise the need to improve quality of networks, a substantial number of contracts are being won by multinational telecoms solutions providers</li><li>● 3G licences recently awarded, and NGN infrastructure has already been deployed by some operators</li></ul>                  |
| <b>Threats</b>       | <ul style="list-style-type: none"><li>● Probable removal of tax breaks for cellular operators unlikely to encourage further FDI in the sector</li><li>● Longer-term risks to the fixed-line sector, if NCC seeks to introduce VoIP services</li><li>● Recent hike in VAT likely to raise retail prices across the industry</li></ul>  |

Source: Business Monitor International, October 2007

Although both Kenya and Nigeria are two of the ten largest mobile markets in Africa, as we saw in figure 1.3 (chapter 1), as at 2007, penetration rates in the two countries, still remain low, at 30.48 (Kenya) and 27.28 (Nigeria) per 100 inhabitants. Why is this the case? Could this be reflective of the cost of rolling out these services, or the inability of the bulk of citizens to afford the services? Presently Nigeria has 4 main GSM providers while Kenya has 2. Yet, call rates, compared with more industrialized, and even some developing countries, are still relatively high. Now, telecom providers (and consumers) in both countries, in a bid to address the specific socio-economic needs encountered in developing countries, have adopted certain specific innovations. For instance, the selling

of prepaid calling cards at low rates, and the owning of more than one SIM card, by consumers. Beyond technology however, the liberalization measures that the countries embarked upon required significant institutional changes that changed substantially the structure of the telecommunication market. In this process, the key actors are the government, and the state telecommunication provider, private telecommunication firms, and the regulatory agencies, which are central to evolving the new competition regime. The important set of issues are the policies and institutions guiding the development of the industry, determinants of pricing structure such as local infrastructure, regulation and income levels among others.

**Box 2.2. Contrasting Telecom Services: USA vs. Nigeria and Kenya**

- In the developed countries, consumers mainly subscribe to the post paid, contract services, whereby the consumer pays a specific amount per month for their services. In fact, it is seemingly easier to use these services, than the prepaid ones, which entail paying for only what you use, that is prevalent in Nigeria and Kenya. However, sometimes with the post-paid service, the consumer may end up using less than what they have paid for (for instance, you might have a 1000 free minutes, and use only 500 of these).
- In the USA, both the calling party and the receiving party pay for calls, while in Nigeria and Kenya, only the calling party pays.
- In both parts of the world, networks attract members to stay with them or sign up with them by making it cheaper to call within the same network and more expensive to others. For instance in the USA, there are services whereby the consumer can pay for calls within the same network e.g. t-mobile to t-mobile is free. An example in Nigeria on the other hand is that with MTN's "Super Cool," whereby an MTN user could call another MTN user between 12am and 5am, as long as they had a N500 balance.
- In the USA, the consumer pays to receive a call or a text message, while in Nigeria and Kenya, as in most other parts of the world, the consumer receives calls and text messages for free.
- With the contract service in the USA, consumers are bound to a particular service by contract for a specified number of time, and consumers usually have only one contract. There, consumers pay for both the phone and the service. In Kenya and Nigeria on the other hand, consumers are able to move freely between services, many holding the SIM cards of more than one company at any one time.

Source: Author's summation.



## Chapter Three

### Price and Quality of Service in Kenya and Nigeria

#### 3.0. Introduction

In order to understand if tariffs consumers are asked to pay are really high, it is important to gain some insight into how much people are actually spending on average. Table 3.1 below shows the amount people reportedly pay per month in a survey taken in Nigeria and Kenya. We see that out of 88 people, only 8% of people report spending less than \$5 on mobile phones each month. For the individual countries, we observe that the highest and second highest frequencies appear in the '\$20-\$50' and '\$50-\$100' ranges. However, for Kenya, 25% of those surveyed spent between '\$50-\$100' on their mobile phones, while 19.44% spent between '\$20-\$50' on their phones. In Nigeria, of those surveyed, these positions are switched, where 34.62% and 15.38% of those surveyed in Nigeria spent between '\$20-\$50' and '\$50-\$100' respectively on their mobile phones. This result might perhaps reflect that people spend a little more on average on their cell phones in Kenya, than in Nigeria.

**Table 3.1: Average dollar amount spent on mobile phones per month**

	Kenya		Nigeria		Kenya and Nigeria		
	Frequency	Percent (Kenya/ Total)	Frequency	Percent (Nigeria/ Total)	Frequency	Percent	Cumulative Percent
Less than \$5	3	8.33/3.4	4	7.69/4.5	7	8	8
\$5-\$10	4	11.11/4.5	5	9.62/5.7	9	10.2	18.2
\$10-\$20	5	13.89/5.7	11	2.15/12.5	16	18.2	36.4
\$20-\$50	7	19.44/8.0	18	34.62/20.5	25	28.4	64.8
\$50-\$100	9	25/10.2	8	15.38/9.1	17	19.3	84.1
\$100-\$200	3	8.33/3.4	3	5.77/3.4	6	6.8	90.9
\$200-\$500	3	8.33/3.4	3	5.77/3.4	6	6.8	97.7
\$500 & above	2	5.56/2.3	0	0/0	2	2.3	100.0
	36	100/40.9	52	100/59.1	88	100	

Source: Author's survey in 2007

Another criteria that we can use to understand how much consumers are spending on their phones, is that which looks at the percentage of their income that these tariffs represent. Of the total number of people surveyed, 77% indicated that they spent between 1-10% of their income, while 18.4% spent between 11-20% of their income on cell phones. Interestingly, according to a 2007 study by the World Resource Institute, found that as people's incomes increase, they increase spending on ICT faster than spending in any other category, including health, education and housing (New York Times, April 13<sup>th</sup>, 2008).

**Table 3.2: Percentage of income spent on telecom services**

	Kenya		Nigeria		Kenya & Nigeria		
	Frequency	Percent (Kenya/Total)	Frequency	Percent (Nigeria/Total)	Frequency	Percent	Cumulative Percent
(1-10)%	31	88.57/35.6	36	69.2/41.4	67	77	77
(11-20)%	3	8.57/3.4	13	25.0/14.9	16	18.4	95.4
(21-30)%	1	2.86/1.1	1	1.9/1.1	2	2.3	97.7
More than 30%	0	0/0	2	3.8/2.3	2	2.3	100.0
Total	35	100.0/40.2	52	100.0/59.8	87	100.0	

Source: Author's survey in 2007

### 3.1 Consumer perception on price

One major indication of the quality of a good is the perception of the consumers. In a survey carried out by the author in 2007 in Kenya and Nigeria, we find that 30.7% and 27.3% of people surveyed, identified the problem of high price for calls through cell phones, as a "severe" and "very severe" problem respectively, as we see in the table 3.3 below. The tables that follow present the perception of customers in the two countries.

Again, from the table below, we see that within the particular countries, 36.1%, 33.3% and 22.2% of the 36 respondents in Kenya, classified price as 'somewhat', 'severe' and

‘very severe problem’ respectively. In Nigeria also, out of the 52 respondents, 32.7%, 28.8% and 30.8%, classified price as ‘somewhat’, ‘severe’ and ‘very severe problem’ respectively. Analyzing the two countries together, we see that less than 10% of total respondents – specifically, 7 out of 88 - viewed price as not a problem or a minor problem!

**Table 3.3: How severe a problem is price?**

	Kenya		Nigeria		Kenya & Nigeria	
	Frequency	Percent (Kenya/ Total)	Frequency	Percent (Nigeria/ Total)	Frequency	Percent
Not a problem	3	8.3/3.4	1	1.9/1.1	4	4.5
Minor	0	0.0/0.0	3	5.8/3.4	3	3.4
Somewhat	13	36.1/14.8	17	32.7/19.3	30	34.1
Severe problem	12	33.3/13.6	15	28.8/17.0	27	30.7
Very severe	8	22.2/9.1	16	30.8/18.2	24	27.3
Total	36	100/40.9	52	100/59.1	88	100.0

Source: Author’s survey in 2007

Another analysis, which can be used to gauge consumer perception about prices, is to see how they compare prices in their individual countries, in comparison to other countries they might have been to. Taking the specific case of Kenya, when people were asked to compare the price of cell phones in Kenya, compared with other countries, 64.8% of people found the rates in Kenya, higher than that in other countries, as seen in table 3.4 below.

**Table 3.4: Rating of price of other networks under country A with Kenya<sup>16</sup>**

	Frequency	Percent
Price is higher in Kenya	18	60.0
Price is lower in Kenya	8	26.7
Price is the same in Kenya	2	6.7
I don’t know	2	6.7
Total	30	100.0

Source: Author’s survey in 2007

<sup>16</sup> The countries (and frequencies) that people indicated in their first comparisons, included Austria (1), USA (2), Uganda (5), Tanzania (3), Rwanda (1), Ghana (5), Nigeria (1), India (3), South Africa (2), United Kingdom (2), Dubai (2), Jamaica (1)

Again, if we look at the particular case of Nigeria, we see that out of total respondents, 39 out of 44 people, representing 88.6% of those surveyed, had experienced higher prices in Nigeria, than in the other countries of which they had knowledge.

**Table 3.5: Rating of price of other networks under country A with Nigeria**<sup>17</sup>

	Frequency	Percent
Price is higher in Nigeria	39	88.6
Price is lower in Nigeria	3	6.8
Price is the same in Nigeria	0	0
I don't know	2	4.5
Total	44	100

Source: Author's survey in 2007

We thus see that consumers in both Kenya and Nigeria perceive the prices they have to pay for their mobile phone services to be high.<sup>18</sup> Now, if consumers believe prices to be high, then perhaps their perceptions cannot and should not be easily dismissed. The fact is actually borne out by the basket of mobile call cost shown for different countries in chapter one where prices in different African countries are decidedly higher than those in the sample Asian countries, and even more so in some of the advanced industrial ones. This in itself provides reason for finding out why exactly these prices are so high. Pushing the issue further, we see that this perception of high prices, is actually serving as a constraint for people using their phones, even as we see in table 3.6 below, where more than half of those surveyed in Nigeria and Kenya collectively, view price as a constraint for usage. In Kenya in particular, only 4 out of the 36 respondents viewed price as not a problem or a minor problem for usage. However, 41.7%, 36.1% and 11.1%, viewed it as an average, severe and very severe problem respectively, for usage. The Nigerian case is

<sup>17</sup> The countries (and frequencies) that people indicated in their first comparisons, included USA (1), Tanzania (1), Ghana (3), South Africa (14), United Kingdom (4), China (6), Kenya (3), Republic of Benin (5), South Korea (1)

<sup>18</sup> These surveys were carried out in the major urban areas, particularly, Nairobi in Kenya, and Lagos in Nigeria. This survey would have been even richer, if the views of those in the semi-urban and rural areas could have been included.

even more startling, where only 4.6% and 5.7% of total respondents, viewed price as not a problem, and a minor problem respectively for usage. This is as compared to 33.3%, 31.4% and 25.5%, who viewed it as an average, severe and very severe problem, constraining them to use their phones. If such a large proportion of people view price as a constraint for usage, definitely there is much to be said for measures to addressing this issue.<sup>19</sup>

**Table 3.6: How do you rate price as a constraint for usage?**

	Kenya		Nigeria		Kenya & Nigeria	
	Frequency	Percent (Kenya/ Total)	Frequency	Percent (Nigeria/ Total)	Frequency	Percent
Not a problem	3	8.3/3.4	1	1.96/1.1	4	4.6
Minor	1	2.8/1.1	4	7.8/4.6	5	5.7
Average	15	41.7/17.2	17	33.3/19.5	32	36.8
Severe problem	13	36.1/14.9	16	31.4/18.4	29	33.3
Very severe	4	11.1/4.6	13	25.5/14.9	17	19.5
Total	36	100/41.4	51	100/58.6	87	100.0

Source: Author's survey in 2007

### 3.2. Consumer perception on QoS

When we examine quality of service, we find that consumers in both Nigeria and Kenya perceive the service to be poor, using such criteria as delayed connection, low call completion, service outage, dropped calls and poor network connection. In particular, 77.1% of the 83 who answered the question viewed quality of service as a problem. Table 3.7 below represents how consumers specifically rate quality of service. Looking at the figures, we see though that consumers in Nigeria find quality of service a greater problem, than those in Kenya. For instance, while 11.4% of the total respondents in Kenya viewed QoS as a severe and very severe problem, 58.8% of the total respondents

<sup>19</sup> In one report, it was found that there were 17 million subscribers who were not using their phones in Nigeria. Could this be because of high prices, or perhaps they have switched over to other subscribers?

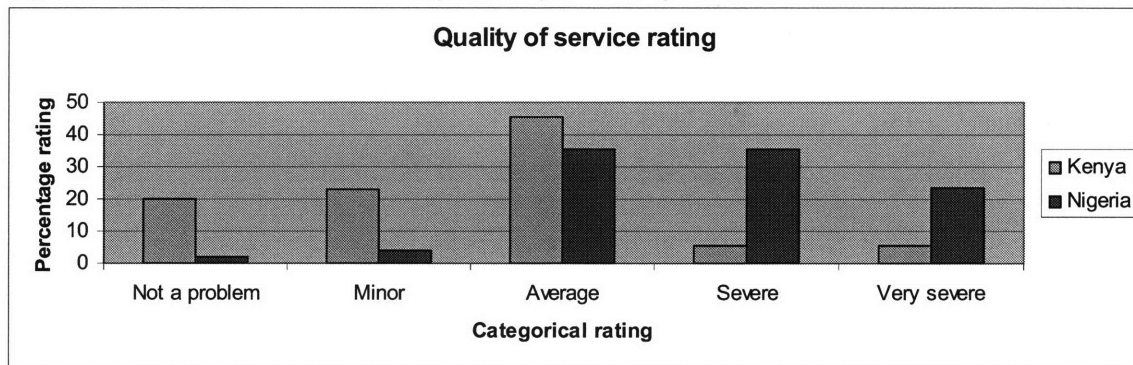
in Nigeria, viewed it as such. This disparity in response is illustrated more effectively in figure 3.1 below.

**Table 3.7: Quality of service rating**

	Kenya		Nigeria		Kenya & Nigeria	
	Frequency	Percent (Kenya/ Total)	Frequency	Percent (Nigeria/ Total)	Frequency	Percent
Not a problem	7	20.0/8.1	1	2.0/1.2	8	9.3
Minor	8	22.9/9.3	2	3.9/2.3	10	11.6
Average	16	45.7/18.6	18	35.3/20.9	34	39.5
Severe problem	2	5.7/2.3	18	35.3/20.9	20	23.3
Very severe	2	5.7/2.3	12	23.5/14.0	14	16.3
Total	35	100.0/40.7	51	100.0/59.3	86	100.0

Source: Author's survey in 2007

**Figure 3.1: Quality of service rating in Kenya and Nigeria**



Source: Author's survey in 2007

However, more generally, we can conclude that in both countries, there is a general perception by consumers that QoS is poor. For Kenya, this is signified by the large percentage of respondents who view it as average. In an interview with a worker in MTN Nigeria, he pointed to the fact that the Nigerian population was much bigger than that of Kenya, as a possible explanation for better QoS in Kenya, than in Nigeria. But once in Nigeria, consumers protested about this low quality of service, by refusing to use their phones for one whole day. One of the reasons deduced by telecoms providers is the poor electricity supply which leads to constant outages and thereby affecting telecoms service particularly in urban centers such as Lagos.

In Nigeria, not only do consumers perceive that QoS is poor. The telecom regulatory body i.e. the Nigerian Communications Commission (NCC) is also well aware of this issue. In fact, the NCC was so concerned by the poor service quality among GSM network services that on 6 July 2007, the NCC issued a ban on all promotions of GSM services in the country due to poor services. The NCC took this action in view of the relentless promotion by service providers even while networks had reached saturation point and were obviously congested. The NCC reached this judgment after carrying out tests with their newly acquired GSM QoS testing equipment. These tests were carried out in accordance with the Commission's 2008 strategy, and would be fully deployed to regularly monitor the performance of the operators across all states in Nigeria.

We thus see that in Kenya and Nigeria, there is the overall perception of high prices and low quality of services for mobile services. Although one could argue the QoS issues are perceived to be much higher in Nigeria than in Kenya. That said, the next chapter would analyze in more detail some of the factors that affect price and quality of service as shown from both primary and secondary research in the two countries.

## Chapter Four

### 4.0. Analysis of Telecommunication Pricing and Quality in Africa

In this chapter we bring together the factors observed in both our secondary data as well as the survey interviews to explain what might be the determinants of telecoms pricing and quality in Africa. The key findings are summarized in table 4.1 below. In what follows, we will elaborate on the issues.

Category	Determinants of price	Determinants of Quality of Service
Input costs	Infrastructure cost	Cost of technology
Socio-economic	Security	Security,
International	Import (foreign exchange)	Type of technology, cost of human technical inputs
Internal	Managerial decision	In-house technical capacity
Operating costs	Workforce	Standard testing
Market	Competition	Interconnectivity, response to unexpected demand
	Technology	Technology
Government	Regulation	Regulation
	Taxation	

Compiled by Author

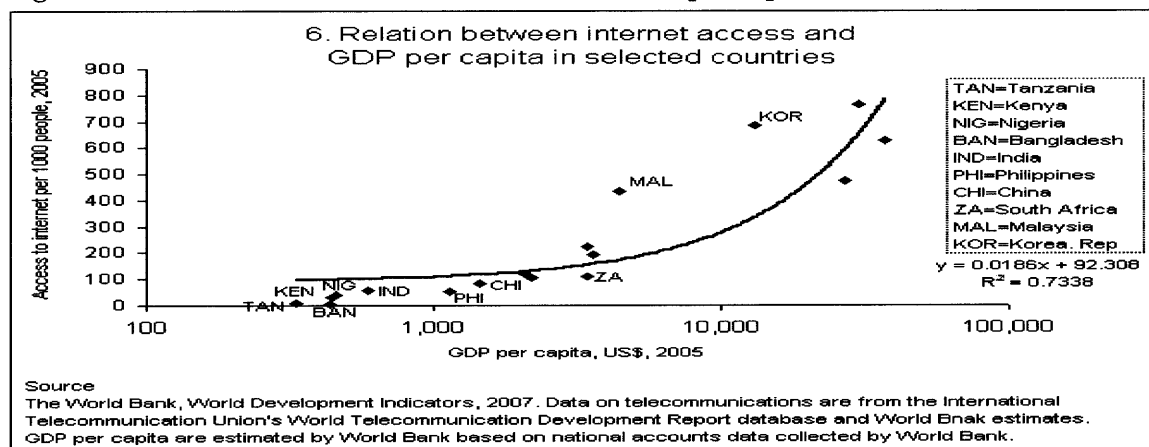
#### 4.1.1. Access and Telecommunications Infrastructure

ICT infrastructure may be divided broadly into three components: telecommunications, computing and connectivity infrastructure. Historically, the key telecommunications actor had been the Public Switched Telecommunications Networks (PSTNs). However, in the last two decades, privatization and market liberalization led to public divestments as well as the entry of new private telecommunications operators (PTOs) into the sector. Massive restructuring has resulted, but more remains to be done in order to create truly



competitive markets in the telecommunication sector in Africa. While some progress has been made in improving connectivity infrastructure, there remains strong reliance on the US Internet backbones for connectivity infrastructure. Skills, innovations and major investments are concentrated in the triad of USA, Japan and Europe. In other words, while users have some form of control on the provision of private computing facilities, access to and the quality of telecommunications and connectivity available to a user depend on geographic space. In effect, the economic environment is a determinant of the access, speed, types of data and, for that matter, information and knowledge to which users have access.<sup>20</sup> Figures 4.1, 4.2 and 4.3 show the relationship based on fixed, mobile lines and international calls for the selected countries in chapter one (table 1. 1). The graph shows the high correlation between national wealth (GDP/capita) and access to telecommunications services. Clearly availability of telephone fosters the diffusion of other telecoms services such as the Internet.

**Figure 4.1: Relation between internet access and GDP per capita in selected countries**

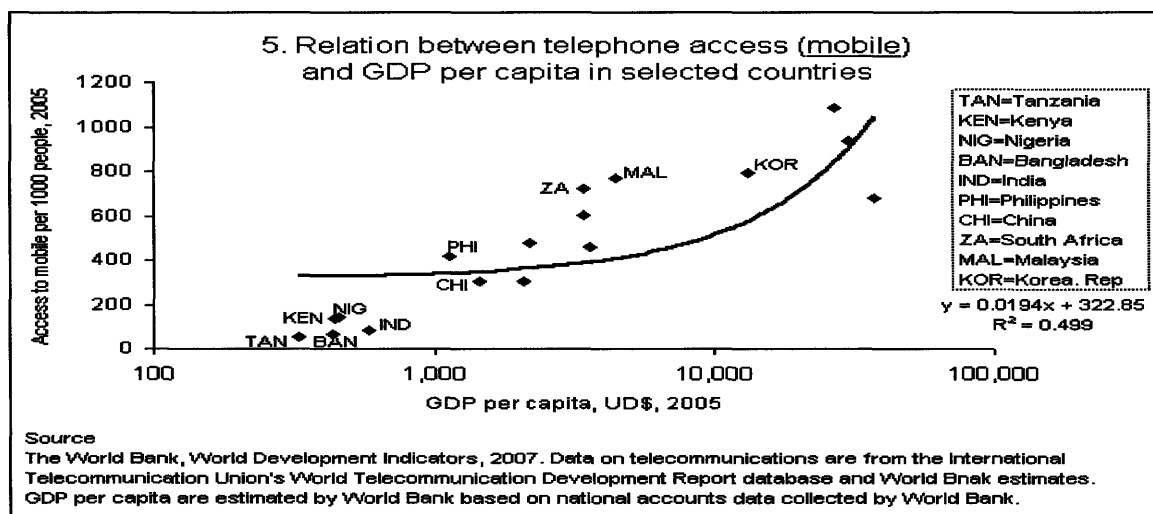


Source 1

<sup>20</sup> Castells, M. (1996) Blackwell Publishers. cites (Porat, 1972) and defines Information as simply : 'data that have been organized and communicated'

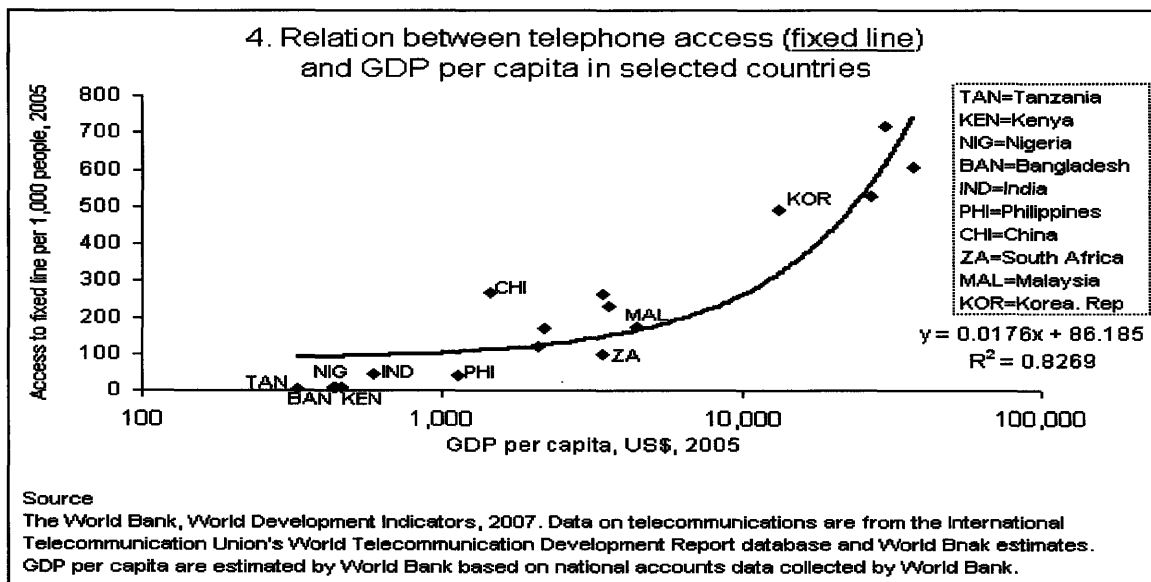
When we examine the telephone cost of fixed line in the 17 selected countries around the world (Africa 4, Eastern Asia 2, South-Eastern Asia 2, South Asia 2, Western Asia 2, LAC 2, and Developed 3), cost for Asian countries is cheapest compared to others. The fixed line cost per month in India is 3.3 US\$, while 31.3 US\$ in United Kingdom. (See Table 1.1)

**Figure 4.2: Relation between telephone access (mobile) and GDP per capita in selected countries**



Source 1

**Figure 4.3: Relation between telephone access (fixed line) and GDP per capita in selected countries**



Source 1

But when comparing the telephone cost of fixed line divided by Gross National Income per capita, the cost in developed countries is the cheapest and Africa is the highest. Fixed line cost divided by GNI per capita is inverse proportion to GDP per capita. (See Graphs 4.4 to 4.6)

On mobile and international call cost, there are no big differences in their absolute costs by different GDP level country. But when we divide mobile cost and international call cost by GNI per capita, the results are same as that of fixed line. The cost divided by GNI per capita is inversely proportional to GDP per capita. (See Graphs)

Access to telephone and internet is higher in higher GDP per capita countries. For instance, while 935 out of 1000 people have mobile in Sweden and 630 out of 1000 people are internet users in United States, only 4 out of 1000 people have an access to fixed line, 52 people have mobile and 9 people have access to internet in Tanzania.(See Graph 4-7)

#### **4.1.2. The Collective Impact of Infrastructure on Telephone Cost**

At the very basic level, African countries have highly differentiated access to infrastructure particularly telephone and electricity services that are widely available in high income countries. The quality of this basic infrastructure is important for the simple reason that information, coded in files, travels through series of linked nodes within the telecoms network which is highly dependent on the level of a country's development. In other words there is a collective effect of this bundle of utilities on quality and cost. For instance, the correlation matrix in Table 4.2 shows the indivisibility of the various

‘wired’ facilities, particularly electrical power and telephone on the one hand, and networks variables comprising personal computers (PCs), modems, and other telecommunication facilities on the other. Internet use and Internet hosts display high correlation among themselves. The correlation derives from a group of 42 African countries, but this propensity equally holds for other highly developed countries and regions (Hargittai, 1999). Figure 4.3 shows how internet access (a proxy for telephone) is correlated to wealth.

For instance in table 4.2 there is a 0.64 correlation between electricity supply and telephone and even higher value for correlation between electrical power and Internet host count (0.83).

**Table 4.2: Correlation of IT Infrastructure and Network Variables in SSA**

Variable	Electrical power	Main telephone	Internet use	Internet Hosts	PC use
Electrical Power	1.000(.000)	0.641*	0.599**	0.838*	0.329***
Main Telephone lines /10,000	<b>0.641*</b>	1.000*	0.965*	0.947*	0.826*
Internet use/capita	0.599*	0.965*	1.000*	0.902*	0.709*
Internet Hosts/capita	0.838*	0.947*	0.902*	1.000*	0.729*
PC use/capita	.329***	0.826 (.000)	0.709***	0.727*	1.000*

\*\*\* .01 level of significance; \*\* .01 level of significance (2-tailed); \* .05 level of significance (2-tailed).

Source: Calculated from World Development Indicators (2005)

### **4.1.3. The Impact of geographic Location on Costs and Quality**

The slowest link in the network node tends to determine the speed of the network and thereby defines the overall speed of data transmission (Dholakia, 1997).<sup>21</sup> In other words, local and regional telecommunications infrastructure such as server connectors, local loop telecommunication lines, inter-nodal connections, and switching systems, among others, determine the cost and quality of access. Users in high-bandwidth telecommunications environment largely in developed countries do have better access to lower cost connections. African countries face capacity constraints, largely a result of thin-bandwidth and frequent power outages; and for this reason are penalized with higher costs of telecom service.

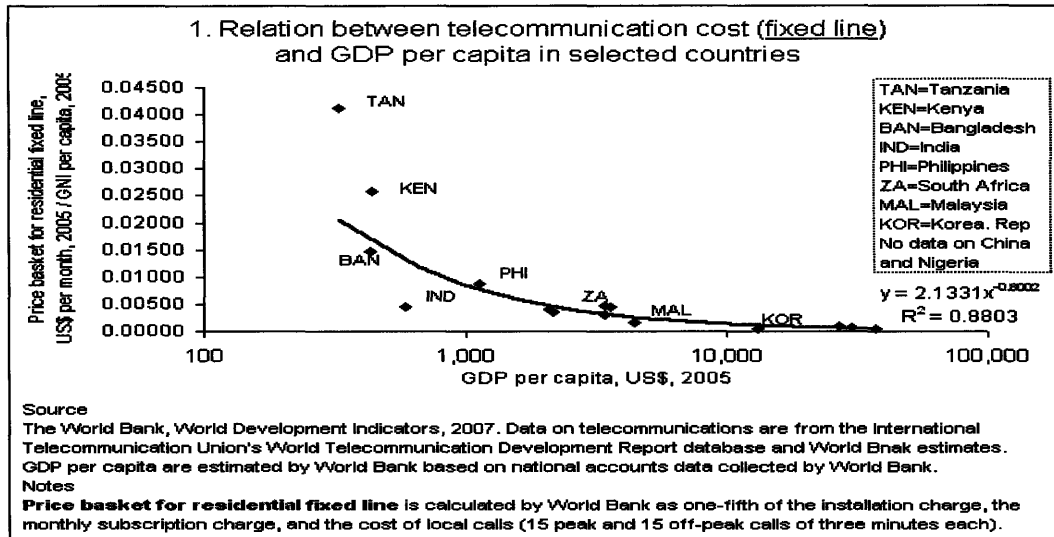
As consumers observe in our interviews, the two countries face persistent power outages due to poor quality of electricity infrastructure, which has profound impact on the effectiveness of the telecommunications services in these countries. For one where there is a lack of good infrastructure, service providers, have to fill the need, by providing it themselves. We see this especially in the case of electricity, where company offices and base stations are run perpetually on generators, which use diesel, 24 hours a day, 7 days a week. The base stations in particular cannot run without electrical power at any time as it would be detrimental to service provision to the end customers. Again, in a situation whereby the companies cannot predict what point electricity is going to be supplied to them by the national carriers, it is hard to put up a structure whereby utilized power is

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<sup>21</sup> For example, a 28.8 kbps modem on a home computer may yield a transmission speed of no more than 24.6 kbps, a speed loss of 14.5% as a result of the quality of telephone lines.

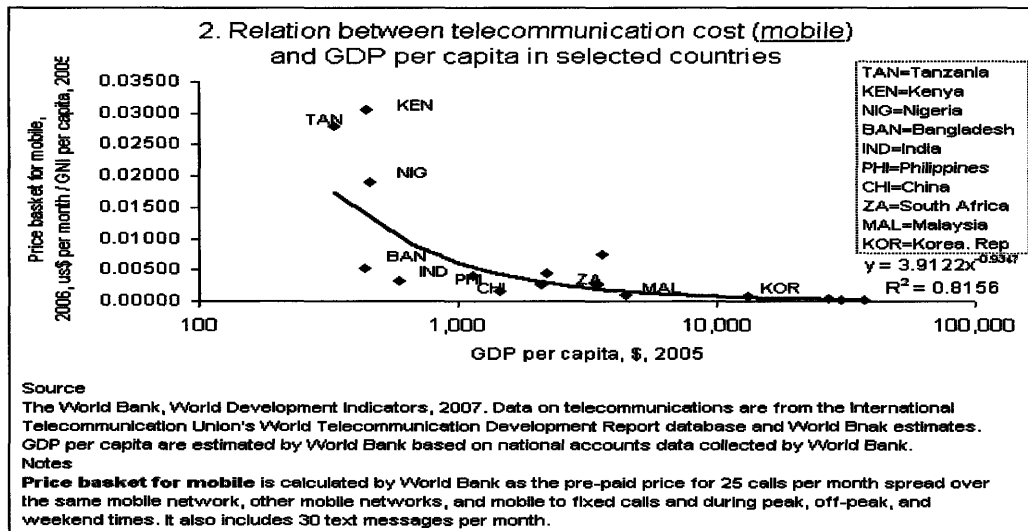
alternated between that which is produced by the generators, and that which is supplied by the national electrical provider<sup>22</sup>.

**Figure 4.4: Relation between telecommunication cost (fixed line) and GDP per capita in selected countries**



Source 1

**Figure 4.4: Relation between telecommunication cost (mobile) and GDP per capita in selected countries**



Source 1

<sup>22</sup> In Nigeria, the national electrical provider is called Power Holding Company of Nigeria (PHCN).

In addition to filling the need for good basic infrastructure, when there is a lack of it, many companies also had to bear the costs of inefficiencies in existing infrastructure. For instance, in many developing countries, the major form of transportation is road transport. While road transport may be seen as the norm, it poses a problem when the roads themselves are damaged or heavily congested. For the telecommunication companies whose staff often has to travel for such purposes as marketing, quality assurance, distribution of products and component parts to areas where they are needed, the mere cost of running the vehicles is a cost that might be indirectly passed to the consumers. For example, take Globacom of Nigeria, which has to transport its recharge cards from their sole place of production in Lagos, to other parts where it is needed. These trips translate into huge transport costs which would not pose so much of a problem, if the roads were not in such bad physical conditions or heavily congested as is the norm much of the time. We thus see that for much of the service providers, the cost equation translates to:

Infrastructural cost = cost of power supply (generated or supplied);  
transportation costs;

Inefficiency costs = diesel (to fuel generators which are substituting for  
lack of electricity from the national grid).

Box 4.1 is based on an excerpt and interpretation of the power problem, from a Nigerian newspaper, the “STAR.”

**Box 4.1: Power to Telecommunications Base Stations – A Modest Proposition” by Russell Southwood**

“The difficulty for Government and its agencies is that in most African countries, the money has simply been put away in the wrong drawer, labeled ‘please spend on telecoms only’. For Africa has only three horizontal regulators (Mauritania, Niger and Rwanda) who have the task of tackling both power and telecom issues together. But this is simply a “box mentality” and if there is recognition that the problem is important and a will to do something about, money exists to tackle it. If the recent forum held by Nigeria’s regulator NCC is anything to go by (see Telecoms News below) then there is an awakening understanding that power is a problem. It’s then a case of converting this into political will to get something done.”

The following is an analysis based on an article by Russell Southwood who is trying to find a way out of the dead end, after noting that:

“One of the largest Sub-Saharan operators has over 5,000 base stations in a single country, many with two back-up generators. Is it in the telephony or the power business?”

- Base station → \$125, 000

(Including the mast, the generators, the equipment to transmit, air conditioners to cool it, fencing and a hut for the equipment)

- In countries like Nigeria or South Africa, the number of base stations required to run them, run into the thousands
- For most other African countries, hundreds are needed. E.g. MTN’s Lonestar in Liberia, a relatively small but undeveloped country, will have 100 base stations at the end of its current investment phase

- Base stations (type I) → \$ 2500 per month

- Base stations (type II) → \$20,000 per month ~ \$210,000 per annum

Where:

- Type I base stations are those with relatively easy access to roads and grid power
- Type II base stations are those without relatively easy access to roads and grid power

- Base station (type A) → 1 diesel generator

- Base station (type B) → 2 diesel generators

- Base station (type C) → tanks to store up to 3 months worth of fuel

Where:

- Type A base stations are those in urban areas with power supply from the state energy utility, and need but one diesel generator as a back-up
- Type B base stations are those beyond the reach of the national power grid and need 2 diesel generators, to allow for continued generator-provided energy, in the event of one generator failing
- Type C base stations are those, which are in sites far from where diesel can be reached and therefore need to store a lot of fuel



## **4.2. Security**

Telecommunication companies are more often than not associated with big sums of money. On the one hand, this could be in terms of the huge profits being made by the industry. Still, another dimension to the big money associated with the telecomm companies is in the supply of inputs and other intermediate materials such as equipment and component parts for base stations, cables such as the copper wires laid for transmission, the generators used to generate power, and so on. To this end, a lot of telecomm operations necessitate investment in security arrangements to secure both the base stations as well as other the telecomm facilities, where there have been incidence of theft of generators, copper and other valuables from these companies. For instance base stations are usually installed in far-flung places far from the secure zones of the city centers. For this reason telecom firms have to make their own private arrangements for security.

The problem associated with theft which leads to the need for security might actually be reflective of a larger socio-economic problem. That is, if people were reasonably employed, they would be less likely to risk their lives in stealing equipment from companies, let alone have the time to do so. Concurrently, if those who have the mandate for securing activities within the country i.e. the police were as efficient as they should be, telecomm companies might not need to employ so many security guards to ensure the safety of their equipment.

### **4.3. Importation Costs**

In many developing countries, many of the production inputs, from the computer which telecomm companies use in their offices, to the equipment used in the base stations, to the particular hand sets that the consumers themselves use are imported. The question that arises would be if it would be more cost effective to produce these equipments within the countries. If no, then importation costs are an efficient and necessary part of the operating costs of the companies, which are reflected on the tariffs that consumers do have to pay. On the other hand, if it were cheaper for the manufacturing companies to be based within the countries, in this case Nigeria and Kenya, employing local resources and people, and generating increased employment in that sense, then importation costs can largely be accounted for as an inefficient and unnecessary part of the operating costs of the companies, which then factor into the tariffs that consumers have to pay.

### **4.4. Managerial decision**

One of the issues that came out of interviews with the firms is that a very critical determinant of price within the telecommunications industry, are decisions taken by managers. While management take into other account such factors as feedback from consumers, the competitive strategies of other service providers, cost of power and so on, they themselves often decide to set the tariffs at certain levels. Sometimes this price ranges could be a reduction during a time of promotion, or putting the price back to normal, after the promotion is over. Again management may decide whether or not to respond to the price drops of other service providers, or can let their own companies be the pace setters.

#### **4.5. Competition**

Competition plays a huge role in the price that consumers pay for their services. As economic theory shows, this happens when a market begins to move from one dominated by a monopoly provider, to competitive regime where the suppliers in the market become more price takers, and less price makers. The telecommunications market in particular, becomes especially challenging for the service provider to work in. In a situation where there is only one provider, as was the case in many developing countries, with the government owned service provider, that company could set its own prices. On the other hand, in many markets today, there are more than one providers, and the consumers have a lot of information on the prices charged by the companies and can usually move from one service provider to another.

In Nigeria, the service providers are forced to take into account their competition, even more so than in many developed countries; this environment reflects ways that the companies are constantly carrying out aggressive promotions to attract consumers to their own service. Furthermore, consumers can easily switch from one service provider to another. In Kenya, the case is a little different as there are only two main providers. However, consumers can generally express their perceptions of the advantage of using one network versus the other, and vice versa.

One perfect example of the influence that competition has on price is with respect to the “pay by second” versus the existing “pay by minute” pricing of GSM calls. When Globacom first started business in Nigeria, they introduced the pay by second system,

whereby the consumer only paid for the seconds they used, as compared to the existing service offered by the other providers, whereby each call was rounded to the next highest minute, regardless of if they used the whole minute or only a few seconds of that minute. At the time, the other providers told Globacom that paying per second was an impossible service to introduce. However, when Globacom introduced this innovation and introduced their pay by second system, the other providers also found a way to do the same. The pay by second system therefore reduced total charge per call for the consumer.

#### **4.6 Technology**

Within the telecommunications industry, as with any other IT driven industry, companies constantly have to keep up with the changing technology for several reasons. For the telecommunications industry, some of these reasons include the effort to deliver better quality of service to their consumers by getting better and more up-to-date equipment, or sometimes in order to keep up with competition in the market. We find a situation whereby MTN Nigeria, initially did not have the equipment needed to allow calls over highways. However, with the laying of optic fiber, over time, their calls became more far reaching. Again, the particular company constantly ploughs back profit into the company in order to meet update its telecom technology. This would enable it to be in a better position to compete not only locally, but also internationally.

#### **4.7 Regulation**

Regulation of service providers by the industry regulator, clearly have an impact on the tariff charged to the consumers of the mobile phone. In Nigeria for instance, all service providers have an “07” number, which enables consumers to make calls (either with GSM or CDMA) between states for instance, without it reflecting as an out of state call, as the regular fixed line would have shown. With this policy by the NCC, they are trying to reduce costs and equalize things.

#### **4.8. Taxation**

Taxation is another factor which contributes to the tariff that consumers are charged. According to a Multilinks telecom officer that I interview in Nigeria, for every call made from a phone (they provide CDMA services), the customer has to pay a 5% tax. To this end, for one of their internet services, where the customer pays N15, 000 per month, while the customer pays N500, as calculated by a 30-day month, the minimum the customer has to have on their account everyday, ranges between N525 and N530, because of the 5% tax on the N300 that has to be paid. A more poignant example was the situation whereby the government increased the tax to be paid, and the company immediately increased the mobile phone tariffs by the same percentage.<sup>23</sup> The government however reversed the tax, perhaps because the impact on the customer was all too evident. We see this government – service provider – consumer cycle re-iterated in the words of Russell Southwood, in his article, “Power to Telecommunications Baser Stations – A Modest Proposition,” where he writes that:

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<sup>23</sup> This practice is called a ‘pass-through’ and it suggests that the company has the power to charge prices at will

“Currently Africa’s mobile companies are charged somewhere between 25-35% in taxes. No-one is saying that the mobile companies should not pay taxes and because they are efficient organizations, they serve as an extremely useful way for less efficient Governments to collect tax. But the higher the tax levels imposed on the companies, the higher their operating costs and as sure as night follows day, the higher the amounts they have to charge people using their services.”

Relatedly, a challenge that the telecomm providers face is that of multiple taxation. Multiple taxation is a situation whereby the providers are charged by different tiers of government – federal, state, local and sometimes even by traditional rulers. One service provider noted that the other tiers of government, excluding the federal government, forget that the service providers had paid so much to acquire the license, and that the money they had initially paid out to acquire the license should have trickled down from the federal level, to the other tiers of government.<sup>24</sup> This issue of multiple taxation is one of which the government is aware. The Executive Vice Chairman of the NCC, remarked that “.... electricity is the greatest headache of the [telecomm] industry, followed by the multiple regulations and taxes imposed to the service providers by some state governments,” at the Maiden Consumer Congress organized by the Consumer Protection Council (CPC). At some point, the Nigerian federal government tried to address this issue. However, the situation remains unresolved, and according to an interviewee, this is because the Nigerian states are supposed to be autonomous, and these states are the ones on the receiving end, the situation remains unresolved. If this taxes are to be legally collected, the process should be clarified to the service providers and a system of accountability should be put in place.

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<sup>24</sup> Globacom Nigeria initially lost \$250 million during the initial bidding.

#### **4.9. Operating Costs**

Another factor that the telecoms companies factor into their costs, are those regular operating costs that any business has to account for. These costs include salaries, benefits and compensations for the task force, and other day-to-day costs. The telecomm industry in many developing countries is a competitive and fierce one for the employer. This is because there is a scarcity of a well-skilled work force to adequately meet the demand in the rapidly expanding industry. A staff of one of the service providers commented that you get to a point, where the employees themselves are the ones negotiating. He further noted that firms face rapid skill turnover as new companies enter the industry and offer mouth-watering salaries to the key staff of existing companies. For instance, a network engineer remarked that one can resign and immediately get another job.

Now, companies have to invest in their workers by way of continuous training and work packages in order to *try to* retain their workers. Thus, the industry is at a point where the employees can negotiate their salaries, where the companies have to offer competitive packages to employ the best hands, and where the consumer might have to pay the tariffs that reflect these ongoing workings within the telecomm labor market.

## Chapter 5

### Conclusions, Implications and Recommendations

Having considered the questions of why prices are still high, and quality of service low for cell phones in many African countries, using Kenya and Nigeria as cases, this chapter presents the conclusion of the study, implications for African countries, specific recommendations and potential areas for future study.

#### 5.1. Implications

From the study, we can conclude that there are many reasons why prices that consumers have to pay for their mobile phone services, are high, and quality of service received are purportedly low. We can however conclude that over the years, prices have declined, owing to the role of such factors as competition, the role of regulation and technology in the telecommunications industry. One might then ask the question of whether or not we expect prices to become even lower than what we see now, and at what rate further decline would occur. From this study we reach the conclusion that there is a certain price level, which if service providers offered to their consumers, they would begin to produce at a loss, or at worst be unable to give dividends to their shareholders. One might argue that under normal conditions, service providers would most likely not go below that point.

One condition, under which the service provider might be willing to produce and offer services below that point, would be if it were able to subsidize that particular service i.e. calls, with some of its other services. Some of these other services could include charges



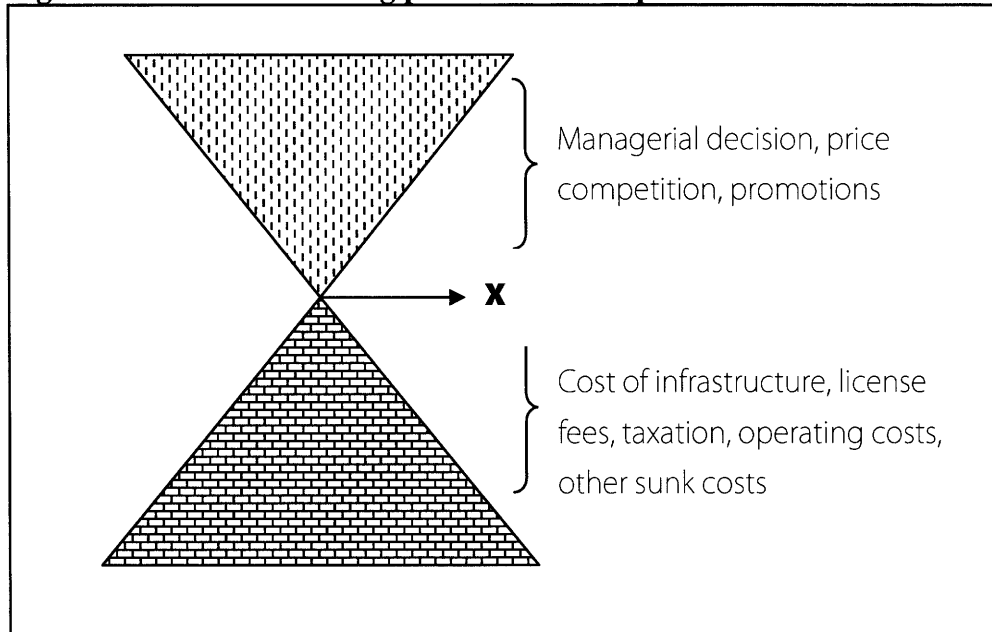
for customer services, international calls and SMS, ring tones or other value added services like e-banking, e-commerce, e-governance and so on. Again, if the company is an international one, it could potentially use its activities in another country to subsidize that in our country of analysis.

This concept is illustrated in figure 5.1 below, where the price below which service providers would be reluctant to provide services is called X. Here, the argument being that below point X, they have such fixed, and invariable costs, such as the cost of infrastructure, the license fees, taxation, and their operating costs, which could include the diesel used to run their facilities. These costs also represent those which are unavoidable, and over which they have no control. In contrast, the area above the point X represents the area in which the service provider can distinguish its product from that of other providers. Here, the provider can offer promotions, explore different tariff schemes, and its other services.

An important implication about distinguishing between these two cost ranges – that which is unavoidable, and that which is controllable by the service provider – is that it poses an important role that the government and the regulator can play. As we have seen in this study, a huge cost for the service provider involves cost of infrastructure including the putting up of base stations and electricity. Another is the upfront license fee and multiple taxes that the service provider has to pay. Here, if the government could work to ensure that these services are effectively and efficiently provided (even if it is with the money collected from the service providers that would be used to service these costs), it

would reduce the point X, to even lower ranges that could purportedly lead to lower tariffs for the consumer.

**Figure 5.1: Decision making point for service providers**



Evidently, price and quality of service seem to be intricately linked. For instance, a consumer might say that one network is quite expensive, but service is good. Another service provider (like the government owned service provider in India), might provide GSM services at a low and affordable rate, while service might not be always reliable. One might argue that economies of scale<sup>25</sup> would eventually set in. However, in the case whereby less than half of the entire population has received these mobile phone services and whereby service providers are still investing in building more base stations, economies of scale might be harder to reach, at least in the foreseeable future. In fact, one

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<sup>25</sup>Economies of scale refers to a situation whereby cost of production decreases, as the producer expands its operations. In the telecommunications industry, economies of scale could be seen in the investment of the service provider in telecommunications infrastructure like base stations, laying of fiber optics, in a bid to increase its productive capacity, leading in the long run to reduced costs in the long term.

might present the scenario that prices should be kept high, so that access is limited to those who can afford it, who are then also assured of proper QoS.<sup>26</sup>

This interrelation between price and QoS leads to another implication, which once again involves the government. In particular, it begs the question how government will analyze the question of whether or not it perceives telecommunication services as a luxury good (not as used in economics)<sup>27</sup>, or a necessity for a country. From the point of view of the consumer, telecommunication services in many developing countries display the characteristics of being a necessity - a good which people find hard to live without. This is evident from the disproportionate percentage of the income that most consumers spend on telecoms services. That said an important role for the government would be to decide if telecom is a necessity for a country, and to provide the enabling environment for the citizens to enjoy the fruits of this innovation.

A classic example of this is seen In India, where we see a huge difference to government's dealings with service providers between 1994 and 1999. Whereas previously, telecom revenue was seen as a way to service balance of payments and unemployment problems, upfront license fees and a duopolistic telecom market structure was favored. However, when in 1999, government's objective for telecom reform was to ensure improved affordability of services, rather than the servicing of its balance of

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<sup>26</sup> This concept is alluded to by Iimi in his paper, where he writes that "Many African countries have a relatively small number of telephone subscribers and considerably high tariffs together. People cannot afford telecommunications services because of high prices. At the same time, however, the existing high prices may be attributable to the current narrow installed bases. This is a typical demand-and-supply endogeneity problem" (Iimi, 7, 2007).

<sup>27</sup> In economics, a luxury good is defined as a good whereby a 1% increase in income, leads to a greater than 1% increase in the expenditure on the good.

payments as was in 1994, up front license fees were eradicated, and a revenue sharing scheme, whereby service providers shared a percentage of their revenue with the government, was introduced. In addition to the revenue sharing scheme, an unlimited number of licensees were permitted into the market (Dossani, 2002).

## **5.2. Specific Recommendations**

In conclusion, the African GSM sector is growing and continues to grow at an exponential rate. However, prices are still higher than they could otherwise be, and quality of service needs to be considerably improved. In order for this to be addressed, all influential stakeholders – government, the regulator, and the service providers, have their own roles to play. Government in particular, though haven played a major role in the liberalization of the sector and good regulatory policies can continue to play a role in providing better infrastructure and incentives which lead to an more encouraging investment environment.

One particular recommendation would be that proposed by Russell Southwood, who suggested that governments and service providers try to reach a win-win situation. His particular proposal being that the governments reduce the taxes that the companies have to pay, while the companies help to find a solution to the power transmission problem that the governments are currently facing.<sup>28</sup> Another recommendation would be if service providers could work out avenues by which they could share their infrastructure. For

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<sup>28</sup> Southwood's proposal includes the mobile operator appointing a private company to build and operate a power transmission network. This company would have as its anchor customers at least two mobile companies. Whatever surplus power it generated, it would either be sold to the national grid operator or be sold on to retail customers, from "Power to Telecommunications Baser Stations – A Modest Proposition."

instance, once is there the possibility of Celtel mounting its tower on the MTN base station and paying some type of rent, and vice versa. This would greatly reduce and subsidize the cost of infrastructure that service providers have to invest, across board.

Again, people parliaments like that which is being done in Nigeria, is also recommended for different countries. Here, consumers and service providers, meet with the regulatory board to present complaints and grievances that they have about GSM services being provided. These parliaments could further be leveraged to become sites of innovation, which would be of great benefit to the entire sector.

### **5.3. Areas for further research**

For this study, there are many potential areas for further research. These include studying the pricing and regulatory environments for other African countries. Another approach would be to use a particular company for instance Celtel or MTN which have a continental presence, and using them as the case of analysis. In analyzing pricing and quality of service for particular organizations, we may be able to better observe the bigger context of the countries in which they are based. Furthermore, there is great potential for analyzing the telecommunications industry and the mobile phone in particular within the field of social sciences. Even now, there is the idea that the mobile phone is acting as a substitute for fixed lines not only in developing, but also in developed countries. What are the implications for this for instance for random polls who use the land lines to carry out their surveys.

More generally, there may also be implications as to what the more developed countries can learn from the developing countries' telecommunications structure. In analyzing the markets in developing countries, it is important that we highlight some of the benefits to the consumer, which are not available to consumers in the developed countries. One advantage for the consumer in the developing country is the ability to switch providers with minimal cost – thus the holding of the different SIM cards or handsets, one for a different service providers. In a country like the United States where “contracts” are more encouraged, it is inefficient for an individual to hold and pay for more than one providers' mobile line at any one time. As put before the Federal Communications Commission in March 2008, it was said that “In the absence of robust competition, under which consumers can switch service providers at minimal cost when they are dissatisfied with the service they receive, information such as that gathered and reported by the Commission through its ARMIS Report 43-05 is essential” (FCC, 5, 2008). The sense one got was that information sharing was important. In developing countries, through mere word-of-mouth, it is easy to ascertain which network has better services or price offers. Also, in a country like Nigeria, service providers actively carry out price promotions and other advertisements, which inform the consumer of price changes, helping them to make better informed decisions. Due to the ease of being able to switch from one network to another and the availability of information, one observes that consumers naturally gravitate towards a preferred service provider. In this case, the market becomes the natural regulator (Dossani, 2002).

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## Appendix

**Table 1: Top ten telecom privatization proceeds, world-wide**

Operating Company (Country)	Privatization Proceeds (millions of US\$)
1. NTT (Japan)	70,469
2. BT (UK)	22,931
3. Telebras (Brazil)	18,966
4. France Telecom (France)	15,902
5. Deutsche Telecom (Germany)	13,360
6. Telecom Italia (Italy)	12,000
7. Telstra (Australia)	10,882
8. TelMex (Mexico)	7,769
9. TeleDenmark (Denmark)	7,693
10. Swisscom (Switzerland)	5,580

Source: Kelly (1999), from Mani Sunil (2004)

Table 2: Mobile competition in selected African countries

Country	Date of 1st mobile licence	Date of 1st competing private licence	State-owned mobile operator?	Mobiles/100 population
Algeria	1989	2001	Y	4.6
Benin	1995	2000	N	3.4
Egypt	1987	1998	N	8.2
Mauritius	1989	1996	N	37.9
Morocco	1987	1994	Y <sup>7</sup>	24.3
Nigeria	1992	2001	Y	2.6
Senegal	1992	1998	Y	7.6
S Africa	1986	1994	N	36.4
Tunisia	1985	2002	Y	18.6
Uganda	1995	1998	Y	3.0

Source: Based on Gebreab (2002), ITU database.

**Table 3: Kenya Telecommunications Statistics (1995-2007)**

	Main fixed lines (000s)	Main fixed lines per 100	Mobile cellular subscribers (000s)	Mobile cellular subscribers per 100 inhabitants	% of total Telephone subscribers
1995	256.4	1.00	2.3	-	-
1996	266.8	1.02	2.8	-	-
1997	271.8	1.00	6.8	-	-
1998	288.3	1.03	10.8	-	-
1999	290.0	1.01	23.8	-	-
2000	291.7	0.95	127.4	0.42	30.4
2001	309.4	0.99	600.0	1.92	66.0
2002	321.5	1.02	1187.1	3.77	78.7
2003	328.4	1.04	1590.8	5.02	82.9
2004	299.3	0.91	2546.2	7.76	89.5
2005	281.8	0.82	4612.0	13.46	94.2
2006	293.4	0.84	7340.3	20.91	96.2
2007	264.8	0.71	11440.1	30.48	97.7

**Table 4: Nigeria Telecommunications Statistics (1995-2007)**

	Main fixed lines	Main fixed lines per 100	Mobile cellular subscribers (000s)	Mobile cellular subscribers per 100 inhabitants	% of total Telephone subscribers
1995	405.1	0.39	13.0	-	-
1996	412.8	0.40	14.0	-	-
1997	404.2	0.38	15.0	-	-
1998	438.6	0.41	20.0	-	-
1999	473.3	0.43	25.0	-	-
2000	553.4	0.49	30.0	0.03	5.1
2001	600.3	0.51	266.5	0.23	30.7
2002	702.0	0.58	1569.0	1.31	69.1
2003	888.5	0.72	3149.5	2.55	78.0
2004	1027.5	0.81	9147.2	7.20	89.9
2005	1223.3	0.93	18587.0	14.13	93.8
2006	1688.0	1.26	32322.2	24.05	95.0
2007	6578.3	4.44	40,395.6	27.28	96.2

## 5. Company Shareholdings

### i. MTN

**Table 5 showing MTN shares in different countries of operation**

Country	Population	Launch date	MTN Subscribers	MTN Shareholding
Afghanistan	31.3 million	July 2006	877,000	100%
Benin	7.8 million	July 2000	562,000	75%
Botswana	1.6 million	September 2005	675,000	53%
Cameroon	17.25 million	February 2000	2,238,000	70%
Congo Brazzaville	3.4 million	December 2005	279,000	100%
Cote D'Ivoire	20.6 million	July 2005	2,302,000	60%
Cyprus	0.9 million	September 2004	106,000	100%
Ghana	22.6 million	November 1996	3,872,000	98%
Guinea Bissau	1.5 million	June 2004	176,000	100%
Guinea Republic	9.5 million	April 2006	523,000	75%
Iran	70.7 million	October 2006	3,720,000	49%
Liberia	3.2 million	June 2004	272,000	60%
Nigeria	140 million	August 2001	14,985,000	82%
Rwanda	9.3 million	June 1998	576,000	40%
South Africa	47.4 million	June 1994	14,076,000	100%
Sudan	37 million	July 2001	1,884,000	85%
Swaziland	1.1 million	July 1998	356,000	30%
Syria	19.1 million	February 2001	2,896,000	75%
Uganda	28.5 million	October 1998	2,094,000	97%
Yemen	21.5 million	February 2001	1,426,000	83%
Zambia	11.5 million	Q3 1995	194,000	100%

Source: Adapted from MTN Group site, based on information as at Sept. 2007

<http://www.mtn.com/mtn.group.web/footprint/map.asp>

## Appendix ix II: Notes on the companies

### ii. Celtel Nigeria

#### Company Tariff Structures

Celtel Nigeria has two main tariff structures. The first is the Celtel 30, which is the traditional pre-paid package. It enables the user to pay per second for every call that they use. The second tariff structure is the "Unity Tariff," which is the first flat tariff to be launched in Nigeria. With Unity Tariff, the customer can use all Nigerian networks, for the same price, per second. According to Celtel Nigeria:

"The new attractive tariffs come in three convenient plans: Simply Special, Simply Smooth and Simply Smart. All come with different characteristics and are tailored for the various needs of the Nigerian people. By providing the same rate, regardless of what network you belong to, the "Unity Tariffs" unite all subscribers regardless of their network, while providing affordability, simplicity and transparency." Celtel Nigeria website, March 07, 2008. <http://www.ng.celtel.com/en/personal-plans/unity/index.html>

Plan	Celtel 30	Celtel 30 (\$)	Simply Special	Simply Special (\$)	Simply Smooth	Simply Smooth (\$)	Simply Smart	Simply Smart (\$)
Monthly charge	No		No	No	N400		N3,600	
Inclusive minutes	No		No	No	No		N100	
Peak, On-net	N0.75		N0.66		N0.59		N0.61	
Off Peak, Off-net	N0.8		N0.66		N0.59		N0.61	
Off Peak, On-net	N0.65		N0.39		N0.33		N0.33	
Off Peak Off-net	N0.8		N0.39		N0.33		N0.33	
International	N1		N0.55-1.00		N0.55-1.00		N0.55-1.00	
SMS local	N15		N9		N9		N9	
SMS international	N15		N15		N15		N15	
Free SMS (per month)	6		15		15		30	

### Additional Benefits with the Unity Tariff Plans

Benefit	Details
Midnight Happy Hours	Call for 10k/sec between 00.30am-4.30am
Friends and Family	Select 5 friends or family members and make calls for as low as 21k/sec to them
Free On-net SMS per month	15 (Simply Special and Simply Smooth), 30 (Simply Smart)
Recharge bonus	10% upon recharge (recharges of N1000 and above)
“Call me back”	300 per month (free)
“Credit me”	300 per month (free)

### New International Tariffs

The “Unity Tarrifs” from Celtel reduce international calling rates to the most popular international destinations by up to 45%. Also, additional discounts enable subscribers to

enjoy the benefits of Celtel's pan-African presence and get great rates to popular countries in regional Africa.

Countries	Zone	Tariff (N/sec)	Tariff (\$/sec)
UK, USA, South Africa, Netherlands, UAE, Ireland, Germany, Saudi Arabia, Lebanon, Spain, Canada	1	0.55	
Ghana, Niger, Benin, Italy, Togo, India, Cameroon, China, Chad, Philippines	2	0.65	
All other	3	1	

### Celtel SMS Tariffs

	Peak	Off Peak
Activating the SMS service	Free	Free
Receiving messages	Free	Free
Celtel to Celtel messages	N15 N10 (Celtel 90 series)	N10
Celtel to other mobile	N15	N10
International SMS messages	N15	N15

## 6. Survey description

### On the Quantitative Analysis

In order to address the research question of why prices are still so high and quality of service low, questionnaires were drafted and administered to cell phone users in both Kenya and Nigeria (see appendix for sample questionnaire).

### Sample Description

In total, 88 people from varying backgrounds in Kenya filled out the questionnaires, while 100 did so in Nigeria. While many of those interviewed were engineers and others involved in work related to information technology, and researchers, others included workers at the United Nations, interns, a cloth retailer, and so on. The professions of those who filled the questionnaire, were largely reflective of where the questionnaires were distributed. In Nigeria, for instance many of the questionnaires were distributed during a workshop aimed at training IT specialists, and at the Nigerian Institute of Social and Economic Research (NISER). In Kenya, I personally administered some questionnaires during an IT specific forum. On the one hand, the distribution of those who filled out the samples, might be seen to bias the study. However, it could be advantageous in contributing to having the data not only filled with information from a user perspective, but also people who are familiar with the workings within the telecommunications sector. Of those who filled the questionnaire, 12 were self-employed, while the remaining 66, were not.