# THE DETERMINANTS OF TELECOMMUNICATIONS GROWTH IN KENYA

BY

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# DECLARATION

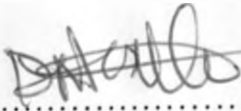This project is my original wok and has not been submitted for a degree in any other university.

Signed ...~~Mulyachagua~~... Date...10/12/2004......

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This paper has been submitted for examination with our approval as university supervisors.

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# **DEDICATION**

Dedicated to my wife Rachel for the encouragement during the entire study period, also to my children Nyambura and Gachagua who were not only growing up as sister and brother during this period but also as friends.

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# 1.0 BACKGROUND

## 1.1 Historical Evolution of Telecommunications in Kenya

The development of a large-scale telecommunications infrastructure capable of delivering efficient, affordable information and communication services is recognized as a critical prerequisite for a country's economic growth and development.

Kenya's earliest telecommunications connections to the outside world were the submarine cables linking Zanzibar, Mombasa and Dar-es-Salaam laid by the East and South Africa Telegraph Company in 1888. Internally, the construction of a telegraph network began with a 200-mile coastal line linking the port of Mombasa with Lamu. Extension to the interior of the country began in 1896 in conjunction with the building of the railways system. The extension of the telegraph line even overtook the railway construction, reaching Nairobi in 1898 and Kampala and Entebbe in 1900. Telephone service soon followed. In 1908 public telephone network began service in Nairobi and Mombasa. In the same year 18 telephone subscribers were connected. The subsequent history of Kenya's network is that of gradual but sustained expansion.

Kenya's inland network in 1993 was still, very small with 184,583 working exchange lines in use. The size of the network had more than doubled since 1983 with major efforts undertaken to upgrade it. The international services are provided via submarine cable systems, the INTELSAT satellite system accessed via four standard A earth stations in Longonot Nairobi and Kericho and terrestrial microwave radio links to neighboring countries. Time Division Multiple Access (TDMA) equipment was installed at the INTELSAT earth stations occurred to help meet the rising demand for international capacity.

## 1.2 State of Telecommunications Sector in Kenya

In the 1980s, growth of Kenya's telecommunications network occurred on a larger scale. The Kenya Posts and Telecommunications Corporation undertook 3 telecommunications development programs. The first program ran from 1979 to 1983, the second from 1984 to 1988, and a World Bank funded program negotiated in 1985 began disbursements in 1987 and was completed in 1992.

The Kenya Communications Act, 1998, which came into force in February 1999 provided for the split of the incumbent operator, the KPTC, which formally occurred on 1st of July 1999. With split, three bodies were created; Telkom Kenya Ltd was established as a public telephone operator under the Companies Act. Telkom Kenya, which is wholly owned by the Government of Kenya, has exclusive monopoly in local telephone (Nairobi only), National Long Distance Telephone services, international telephone services and Internet backbone. This monopoly is ended in June 2004.

The Postal Corporation of Kenya was established as a postal licensee with a specific role, to ensure universal access to postal services. On the other hand Communications Commission of Kenya was established with the object and purpose of licensing and regulating telecommunications, radio communications and postal services in Kenya. The commission is the governments designate representative to all international organizations in all matters dealing with telecommunications, radio communications and postal affairs.

## 1.3 Regulatory and Policy Environment

Prior to 1998, the Kenya Posts and Telecommunications Corporation (KPTC) provided telecommunications and postal services in Kenya on an exclusive basis. Though the market has seen the entry of competition in certain service lines, fixed line telephone services still remain in the hands of Telkom Kenya although further competition may rise as a result of the end of this monopoly.

Rivera (1996) stated that the ability to establish and expand valuable telecommunication services into Kenya's potential market is creating a new competitive challenge. It could be argued that in many cases, consumers, users of public services and civilians would be among the main beneficiaries of privatization. He further stated that the great paradox is that they do not necessarily perceive the potential benefits of privatization as a tangible possibility. The wave of liberalization is sweeping through Kenya. The new era of liberalization and competition is bound to see real winners and losers. With electronic data interchange it is possible to see that electronic trading offers the prospects of developing close relationships between companies, suppliers and customers provided all the participants were prepared to commit themselves.

According to Gregg (1995), the use of mobile communication, fax, email, paging etc, has enabled companies to contact one another twenty four hours a day seven days a week whether staff are in the office, on the road or at home. In the hyper competitive business of the 21$^{st}$ century there will be a galaxy of opportunities, threats, and risks for both incumbent firms and new entrants. All telecommunication operators now operate with utmost flexibility to create new offerings, business models, distribution channels and infrastructures. They will therefore need to design business models and infrastructures specifically meant for the targeted customers and profitability, reduce

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the cost of producing services aggressively and progressively and identify and target the most valuable customers in line with the business model.

Since 1977, when the East African Community was disbanded, the Ministry of Power and Communication handled the national and international postal and telecommunication services. Recent decades have seen a dramatic expansion of telephone services. In 1986 an external consultant's strategic and review of KP&TC recommended a number of short-term operational measures which, included restructuring and liberalization of telecommunication services (World Bank Report, 1992). In 1970, there were 0.69 telephones per 100 people in Kenya, mostly in urban areas. Rural areas were a less well served with only 7 telephones per 10,000 people. During the 1970s, Kenya undertook a program to reduce the disparity between urban and rural communications, which involved modernizing the existing facilities as well as opening 170 new post offices, and providing telephone, telegraph and telex offices in under-served areas. By the end of the decade, there was one post office for every 22,900 inhabitants compared to 28,800 at its beginning.

A major telecommunications development project funded by the World Bank, introduced international subscriber dialing in late 1984. Exchange lines quickly rose from 70,000 to 106,000. Table 1.1 shows Kenya's telephone business and broadcasting in 1989.

Table 1.1: **Kenya's telephone business and broadcasting in 1989**

| Telephone | |
|---|---:|
| Number of lines | 337,000 |
| Tele density (No. of persons per telephone) | 69 |
| **Phone traffic in millions** | |
| Local | 5,737 |
| Long distance | 6,799 |
| International | 15,776 |
| Satellite earth stations | 2 |
| **Radio broadcast stations** | |
| AM stations | 16 |
| FM stations | 4 |
| Television broadcast stations | 6 |
| Short wave | 0 |

Source: KPT&C Annual Report 1990.

Like other countries in Sub-Saharan Africa, Kenya faces serious challenges in its quest to provide universal telecommunications services. By the end of 1997, the total number of connected lines in Kenya was more than 269,000 generating a teledensity ratio of slightly below 1%. Although this is high in the region, it is comparatively low compared with developed economies where telecommunications are now available in use in healthcare delivery, telecommuting, and interactive distance learning – the very applications the country needs in its quest for development and vision of becoming a newly industrialized country by the year 2015.

Table 1.2: **Kenya's telephone network 1995-97**.

| Year | 1995 | 1996 | 1997 |
|---|---|---|---|
| Main lines | 269,369 | 261,406 | 269,773 |
| Main lines per 100 people | 0.79 | 0.82 | 0.81 |
| Waiting List | 70,581 | 70,578 | 77,163 |
| Payphones | 5,922 | 5,932 | 6,069 |

Source: African Telecommunications Indicators ITU 1998.

In spite of many but partial policy reversals, Kenya's telecommunication liberalization has had positive effects. For example the cellular mobile phone market has rapidly overtaken the fixed line market, which has stagnated at about 350,000 lines, while the cellular mobile phone market had grown to over the same figure by 2002. This is a clear indication that the current operators have not been able to meet the market demand. However the cellular phone market continues to be dominated by Safaricom and Kencell companies.

Table 1.3: **Kenya's cellular mobile telephone market 1997 - 2001**

| Provider | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|
| Safricom | 3,000 | 6,000 | 15,000 | 54,000 | 160,000 |
| Kencell (Now Celtel) | -------- | ---------- | -------- | 60,000 | 190,000 |
| Total | 3,000 | 6,000 | 15,000 | 114,000 | 350,000 |

Source: African Telecommunications Indicators ITU 1998.

## 1.4 Problem Statement

The defunct Kenya Posts and Telecommunications Corporation had been sheltered from competition and operated within national boundaries. Most Kenyan consumers had no choice over the supplier of telecommunication services but today there are an increasing number of firms operating in the sector. However, nearly all the strategic telecommunication services continue to remain in the hands of Telkom Kenya Ltd.

The deregulation of the telecommunication industry in Kenya and the intended sale of Telkom Kenya Ltd has emerged as key issues in the Kenya economic policy today, yet there has been very little high quality economic analysis capable of guiding our policy markers. The three most important issues include:

(1) General principles governing competition and regulatory policy in telecommunication industry in Kenya.

(2) Telecommunication sector is faced with shifting patterns of ownership and market structure in combination with extraordinary technological change hence creating enormous challenge for regulators.

(3) The establishment of a single market and the promotion of competition have been in the forefront of economic and industrial policy in the recent years.

Deregulation has brought competition in the Kenyan telecommunication industry and regulation is still at the center stage of activity. Conflicts between monopoly and competition and market forces and regulation have given rise to many challenging policy problems. While the privatization of Kenya Airways remains a success story of privatization in Africa, the privatization of Telkom Kenya continue to be hit by controversy. For this reason, telecommunication liberalization in Kenya has been slow and regulation scrutiny is needed as the industry moves through the three phases

of liberalization, which it has taken i.e monopoly, monopoly and partial competition and full competition.

As the industry moves through the three phases, there have been conflicting priorities that have characterized the regulatory environment such as: slow versus fast liberalization, public versus private ownership, sector specific regulation versus general competition law and permanent versus temporary regulation.

Again the government will have to determine the regulatory model to adopt. Among the possibilities that the government may have, include; an independent autonomous commission, an independent semi-autonomous regulator, independent official body supported by the government ministry, the regulator to be part of government ministry or no regulator where the industry relies on competition law. However telecommunication service penetration remain very poor especially in the fixed lines with only about 350,000 lines currently, with a teledensity of 1 line per 100 persons on average, 0.16 per 100 persons in the rural areas, 4 in the urban areas with only 4.2% of the households with fixed lines in the urban areas. However there are over 1.5 million mobile phone lines at present, a trend that shows that the mobile phone is quickly replacing the fixed line.

Privatization is normally expected to bring along with it substantial capital inflows along with new business practices that are expected to achieve improved managerial and operational efficiency as well as price reductions, rapid expansion and upgrading of network from the larger capital flows and more timely provision of new services. Nonetheless there is considerable evidence that at least in so far as influencing efficiency is concerned, competition is a much more important factor than ownership.

The study therefore intends to find out the growth trends in the telecommunications sector in Kenya since 1982 and the factors that have led to this growth.

## 1.5 Research Questions

Kenya's telecommunications policy and organizational structure has until recently, followed a monopolistic approach. However this policy appears to be just beginning to be influenced by the wave of change towards increased competition that has swept other advanced industrial areas of the world during the late 1980s and 1990s. This project therefore intends to address the following research questions:

(a) What has been the major determinants of telecommunications growth in Kenya?

(b) What has been the growth trends of telecommunications in Kenya since 1982?

(c) Has there been any significant change in telecommunications growth sector since liberalization?

## 1.6 Objectives of the Study

The general objective of this study is to investigate the trend of telecommunications growth in Kenya since 1982 and the factors that have led to this growth. Subsumed in the general objective are the following specific objectives:

(a) To examine the major determinants of telecommunications growth since 1982.

(b) To examine the extent to which liberalization has contributed to telecommunications growth in Kenya.

(c) To make policy recommendations based on the findings of the study.

## 1.7 Significance of the Study

The key to increasing growth in the telecommunications industry is sustained investment and investment in new technologies. Telecommunications can contribute to GDP growth by, for example reducing economic inefficiencies. Again it can enable new economic activities to take place that could not have done so without phones. Moreover telecommunications is a spawned industry in itself. From creating direct employment of skilled personnel, to nationwide distribution networks, internet cafes, and advertising revenue. In the informal sector, unofficial phone shops have sprung up and merchants make business out of selling scratch cards mobile phone and other accessories.

In many developing countries, the decision to privatize is a difficult one to make because the costs and benefits of privatization are not readily assessable and the legal and regulatory issues associated with privatization that have to be addressed are quite complex. Again conflict between profit objectives and policy goals having some bearing on social welfare may not be easy to reconcile.

Again telecommunications infrastructure lies at the heart of the information economy. Countries lacking modern telecommunications infrastructure cannot compete effectively in the global economy. Rapid innovations in telecommunications are lowering costs, creating new services and changing the cost structure of many industries.

This study is important in the sense that Kenya like any other developing economy is in the process of implementing structural changes in its major sectors of the economy. Since telecommunications play a major role in the economy, this study will provide a comprehensive background material on the determinants of telecommunications

growth. Again this study will provide useful information to guide the existing and prospective players in the telecommunication, the regulators and other policy makers on the growth trends brought about by liberalization. This will enable the players to come up with appropriate policies and regulations to attract more investment and technology for the development of the industry. Finally this study will serve as a guide to any other researcher who will in future investigate the determinants of in the telecommunications growth in Kenya.

## 2.0: LITERATURE REVIEW

### 2.1 Introduction

Elbert (1990) defined telecommunications firms as the commercial and non-profit organizations involved in the development, production distribution and exhibition of entertainment and information programming to the public via electronic means. ITU (1995) defines privatization of telecommunications facilities, as the process of transferring ownership of state owned telecommunications network facilities to the private sector along with their operations and management. It can be initiated in a number of ways, involving several stages in a long process – that is, from a government agency or department through government owned public companies to mixed proprietorship or joint ventures to full private ownership. Privatization basically refers to ownership and does not necessarily imply competition.

The aim of reforms in transition economies has been to eliminate immediately, central control over the production and pricing of goods and services and the allocation of resources and quickly thereafter to transfer economic decision making to the private sector. Since privatization cannot be completed all at once, an important element of the reforms has been putting production and pricing decisions in the hands of enterprises and put public and private enterprises on an equal footing. Deregulation of markets including trade liberalization has been considered essential for an efficient allocation of resources.

Bortolotti and Pinotti (2003) observed that in the last two decades privatization policy has swept the world. Up to the end of 2002, governments sold assets worth US$ 1,127 billion in more than 3,535 deals. They further observe that developing countries have also privatized large chunks of their state owned enterprise (SOE) sector under the pressure of international lending agencies. The ITU (1995) observed that the lion's

share of global telecommunications investment goes to developed countries. In 1992, total world investment in this sector stood at US$ 130 billion of which 75% went to high income countries, about 45% being accounted for by just three countries: Germany, Japan and the USA. Developing countries investment record in telecommunications is poor, owing partly to national priorities being given to other sectors other besides lack of foreign exchange. Even countries such as Chile, Botswana and Turkey achieved significant progress over the last decade, were able to do so because of their governments' commitment to telecommunications development backed by high levels of investment.

## 2.2 Theoretical Literature

Savas (1997) cited three broad strategies of privatization: divestment, deregulation and displacement. He defined divestment as the shedding of an enterprise or an asset that requires a positive act by the government and it generally a one-time affair. An enterprise or an asset is sold or given away as an ongoing business or an enterprise may be liquidated. Again the government can privatize by delegation, where, the government delegates to the private sector part of or all of the activity of producing goods or services but retains the responsibility of overseeing the result. He further cited privatization by displacement, which occurs by default withdrawal or deregulation.

According to Waddell (1997), when governments transfer state owned enterprises to private sector, they generally have a number of objectives which include: improving efficiency, reducing fiscal commitments of the state, providing better services to consumers, obtaining sales proceeds and laying a foundation for a market based economy. In Kenya the objectives of posts and telecommunications reform program was mainly to encourage private sector investment to facilitate rapid network

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expansion from the current 0.16 lines to 1 line per 100 persons in the rural areas and from 4 to 20 lines per 100 persons in the urban areas.

## 2.3 Increasing Competition in Kenya

Jain (1999) defined competition as strategic competition, which is the studied deployment of resources, based on a high degree of insight into systematic cause and effect in the business ecological system. He also observes that economists have used different models of competition. Still central to the model of their work is the model of perfect competition, which is based on the premise that, when a large number of buyers and sellers are dealing with homogeneous products, there is complete freedom to enter and exit the market and everyone has complete and accurate knowledge about everyone else.

Henderson (1983) presents competition as rivalry among firms operating in a market to fill the customer need. The businessperson's major objective is to keep the market for himself by adopting appropriate strategies. He sees the marketplace as a battleground where opposing forces (competitors) device ways (strategies) to outperform each other. According to Jain (1999) some of this hypothesis can be readily observed, tested and validated and could lead to general theory of business competition.

According to Wellenius (1989) the privatization of public telecommunications operators does not necessarily lead to more market response behavior since it does not change their monopolistic character (natural monopoly argument). The alternative operators to encourage competition however may not be advisable where significant economies of scale are present i.e. natural monopoly argument. However this may not be applied to the Telecommunication sector as a whole for the major component of the

sector, only physical network i.e. transmission and switching facilities and basic value adding services can exhibit economies of scale. In this case separate and distinct entities can be contracted to supply each category of service.

According to Porter (1980) a firm can take several competitive strategies which may include intensive growth where corporate management first cause of action should be a review of whether any opportunity exist for improving its existing business performance, integrative growth where a business sales and profits can be increased through backward, forward or horizontal integration with its industry and diversification growth which makes sense when good opportunity can be found outside the present business.

Lanza (1995) stated that privatization is the process through which ownership is changed to achieve greater goals of efficiency and equity. Yet it is in the introduction of competition in to the equation that forces efficiency not the change in the asset ownership. On the other hand Gregg (1995) observed that increasingly, commercial and industrial companies are using electronic network as a first and efficient way of doing business.

Elbert (1990) found that the spectrum of competitive entry into telecommunications markets includes forms of competition that is only beginning to appear. These include: government monopoly i.e the classic case of a monopoly vested in government ministry or department, public corporation government monopoly i.e a government monopoly but one instituted through a public corporation rather than a ministry or department, government competition i.e a structure where in both the government and private sector entities compete in the market, regulated monopoly i.e the classic case of private ownership of facilities with regulation by a government department,

regulated competition i.e the extent of competition, number of competitors, and products or services that can be offered by each supplier are subject to authorization, licensing, type approval etc. by a government ministry or agency, and liberalized entry i.e a market situation characterized by absence of all official government rules and regulations that serve to regulate market entry, structure or conduct coupled with complete reliance on private sector entities for the provision of goods and services. As in other public telecommunication networks in the region, the dominant product in Kenya is voice services followed by data services; these services brought in annual revenues of about $300 million in 1996 making the operator the fifth largest in Africa in terms of revenue (ITU 1996).

## 2.4 Liberalization Process

The Kenyan Parliament passed a legislation to separate Kenya Posts and Telecommunications into three entities, i.e., Telkom Kenya, Postal Corporation of Kenya and a communications regulatory body namely, the Communication Commission of Kenya. Previously, the Communications Regulatory Affairs division of KP&TC operated the functions of a regulatory body.

According to *Economic Reforms 1996 – 1998*, the policy framework paper prepared by GOK in collaboration with IMF and WB, the government has started to implement the legislation passed in 1998 to liberalize telecommunications. This was to end the monopoly enjoyed by the KP&TC. Again, Safaricom Kenya Ltd was the only mobile cellular services provider and CCK invited applications for bidders for a second license for mobile cellular services, which was issued in March 2000. According to the government liberalization program, other service providers will be licensed to compete with Telkom Kenya for the provision of local, long distance and international

telecommunication services after a 5-year period. Foreign ownership of telecommunication firms was limited to a maximum of 40%.

This liberalization of the market has impacted on the former monopolistic parastatal in the telecommunication sector in a number of ways. KP&TC under the new program has licensed firms in seven categories dealing with sales, contracting and engineering. These include: terminal equipment vendor/suppliers, terminal equipment installation contractors, wiring supply, installation and maintenance contractors, terminal equipment maintenance engineers, terminal equipment installation engineers and wiring installation and maintenance engineers.

Gregg (1995) further observed that the liberalization of the telecommunication market has encouraged a number of major equipment suppliers, such as GPT and Phillips, to set up subsidiaries in Kenya. However, there are still a few hiccups in the implementation of "liberalization" where Telkom is seen to offer unfair competition to private companies. The other areas include: - data communications, mobile communications and text services.

In its economic reforms strategy for 1996 – 1998 the government considered the private sector as the only basis for sustainable long-term economic growth. The government therefore attempted to increase the role of private sector in the economy through rationalization of private sector firms through an accelerated program for privatization. As the telecommunications sector plays a major role in the economy, coupled with pressure from the World Bank, IMF and the donor community, the government had to come up with a program of its liberalization. With this, it intended by early 1996 to issue a policy statement spelling out the privatization program of the former Kenya Posts and Telecommunications Corporation (KP&TC).

Legislation was presented to Parliament in March 1996 seeking to split Kenya Posts and Telecommunications Corporation into three separate entities; posts, telecommunications and a regulatory body namely; Postal Corporation Kenya, Telkom Kenya and Communications Commission of Kenya.

When approved, the government intended that the three entities be established in December 1996 and the government would open to outside operators 30% of the capital of the new Telecommunications entity through the participation of a strategic investor and through public floatation. The entity would also engage in joint ventures in activities such as cellular phones.

As part of this process, the Kenya Posts and Telecommunications begun to liberalize telecommunication services, beginning with payphones and very small aperture terminal (VSAT) for private operators. The government therefore came up with new objectives and policies for the telecommunications sector in the country, which were the extension and efficient delivery of telecommunication services to remove constraint for more rapid economic growth and the long-term development of Kenya. Prior to 1998, the Kenya Posts and Telecommunications had the exclusive privilege of providing telecommunication services and of constructing, maintaining and operating telephone apparatus within Kenya. However, with the inception of the Communications Act 1998 the telecommunication sector was open to outside operators with Telkom Kenya Limited retaining 5 years monopoly of the provision of fixed line telephone services and two cellular phone providers Safaricom Kenya Ltd and Kencell in the mobile phone market.

It is important to note that liberalization and privatization normally require an effective regulatory system to be put in place to manage the transition and also to;

provide a universal service, protect consumer interest, supervise dominant operators, stimulate investment and new services, introduce competition and manage common resources.

## 2.5 General Impact of Trade Liberalization

According to Ademola (1996) trade liberalization unleashed competitive pressure that many previously sheltered and inefficient industrial firms have been unable to cope with. He further stated that the assessment of the impact of trade liberalization was carried out against several broad expectations. First trade liberalization provides expanded market opportunities and while reducing export bias stimulates export performance. Above all, increased competition from abroad and enhanced access to better technology made possible by liberalization induce technological innovation and higher productivity.

Kikeri (1992) argued that an efficient private sector makes essential contributions to the attainment of the broader goals of economic development and privatization is one of the means available for promoting private sector development. Privatization when correctly conceived and implemented, fosters efficiency, encourages investment and thus new growth and employment, and frees public resources for infrastructure and social programs.

One of the main objectives of the liberalization program is to improve teledensity in the rural areas from 0.16 to 1 line per 100 people and from 4 lines to 20 lines per 100 people in the urban areas. It is also important to point out that even in the urban areas telephones are within offices rather than households. These targets translate to the installation of over 375,000 lines in the rural areas and 2 million lines in urban areas

and the government requires between $ 2 billion and $3 billion for the purpose. This calls for new initiative to attract more investment in the sector.

Due to the large number of fixed line telephone customers in waiting list, many potential customers have been forced to seek alternatives especially in the mobile phone market. Again, even where new exchanges have been installed to meet this demand access network is still inadequate leaving these exchanges with a very high-unutilized capacity. These problems have also not spared other customers especially in data services where the market has heavy congestion and frequent breakdowns.

If companies saw government ownership as a competitive advantage for regulatory or other reasons, there would be significant resistance to privatization by operators. Fisher (2000) found that as of 1999, of the 189 members of the ITU, 90 had wholly or partially privatized their incumbent telecommunication operators; and 18 of these were privatized completely. Of the non-privatized operators, over 30 were planning to privatize. However it is unrealistic to expect firms to privatize overnight, as at the beginning of most privatization programs, national telecommunication firms in smaller countries have a potential market capitalization larger than the entire stock market, so it is impractical to sell shares all at once.

Today communications is at the heart of all economic activities and constitutes a prerequisite to the development and efficiency of all the other sectors of the economy. Kiplagat and Werner (1994) demonstrated that although the development of telecommunications is closely linked to the economy of the country, telecommunication industry could be managed profitably and efficiently even in low per capita income countries.

## 2.6 Empirical Literature

According to Brown (2000) evidence from empirical studies such as country specific studies show that privatization actually improves efficiency. For example the Commonwealth Secretariat published a study on Britain's privatization program. In that study it was found that the main aims of the British government privatization program which began in 1979, were to improve the performance of public sector companies and nationalized industries by exposing them to market forces and widen and deepen share ownership. According to IPC country profile report, the privatization of Kenya Airways is undoubtedly the high point in Kenya's privatization history so far. The government privatized the national carrier through a successful floatation of a 51% government shareholding and the purchase of 26% by the KLM Royal Dutch Airlines.

While studying the impact of deregulation on telecommunications sector in Nigeria, (Jerome, 2003), used a macroeconomic analytical approach. He argued that most studies on the impact of reform in the telecommunications sector relied on total factor productivity. This choice was aimed at capturing at firm level, the differential effects of deregulation on telecommunications services. First he defined total factor productivity as the ratio of aggregate output to aggregate input. He defined the divisia indexes for aggregate output and aggregate input in terms of proportionate rate of growth.

A current study of privatization of telecommunications in Africa sponsored by WB intends to answer 3 key questions faced by policy makers in Sub Saharan Africa. They include:

(1) How greater competition can be encouraged by encouraging efficient entry

(2) How the incumbent telecommunications providers can use their existing assets and invest in additional capacity.

(3) How telecommunications reform can be structured so that it gains the support of key stakeholders and fit well the country's institutional capacity.

The study was undertaken on the basis of the hypothesis that 'privatization that constrain competition is likely to generate sales proceeds but any such benefit is likely to be more than offset by the welfare costs from higher prices and costs, lower investment and less revenue to the government in the long run from taxes, dividend and reduced debt support.

According to Todaro (1997), most studies to date indicate that privatization appears to be successful in promoting greater efficiency and higher output especially in high and middle-income countries. In poorer countries, the results are less clear-cut though some positive results have been obtained. However even though detailed data is yet to be compiled, the effects of privatization on income distribution are likely to increase the gap between the rich and the poor as the rich are able to buy ownership of these organizations and there is no program in place to help the poor participate in the privatization process.

Brue (2000) argued that many developing countries would benefit by converting state enterprises into private firms. He further found that state firms are often inefficient, more concerned with appeasing labor unions than introducing modern technology and delivering goods and services at minimum per unit cost. Moreover state firms are poor 'incubators' for the development of profit focused, entrepreneurial persons who leave the firm to set up their own businesses.

Tyler, Hughes and Renfrew (1997), found that in interviews, KP&TC's top management had stated that its motivation in initiating the move towards liberalization

was a desire to improve efficiency by introducing competition and to have the private sector share the increasing financial burden of supplying terminal equipment, thus freeing KP&TC to concentrate its resources on major projects. They further observed in their study that one user interviewed gave a strong evidence to suggest that KP&TC resources were indeed overstretched in the early 1990s: KP&TC was unable to supply a PBX on a timely basis forcing the company to buy its PBX directly from a foreign manufacturer – a purchase that cost the company Ksh. 200,000 (approximately $7400) instead of Ksh.10, 000 ($370) per quarter rental that it could have paid to KP&TC.

However according to Piercy (1997) state owned enterprises have failed to make the kind of investments in education, healthcare, and other social sectors that are critical to a globally competitive economy and therefore there is broader acceptance of the need of privatization as a critical element for the country's growth and development and its ability to compete globally. Kenya's government has responded to these challenges with a market oriented economic policy which emphasizes openness to the world economy and export led growth. Tyler et al (1997) further observes that this policy necessites a more universal and reliable telecommunication network than would be needed had Kenya attempted a predominantly inward looking centrally directed economic strategy similar to those attempted by other African countries.

## 2.7 Summary of the Literature

Even if privatization seems to follow a common global trend, the extent of divesture varies greatly across countries. According to Bortolotti (2003), some countries have pursued a consistent and sustained privatization policy as part of wider reform packages, while in others, ambitious programs have been blocked on their way by adverse interest groups so that privatization has been sporadic and small-scaled. The

CSP/ITU 1987 study shows that the revenues of KP&TC were constrained far below their potential level by inadequate capacity and service quality, reflected by the long waiting lists and service congestion. Slow repair to faulty facilities was another major cause of lost revenue.

Despite the marginal growth in subscriber numbers, the demand for telephone lines remains high. Cellular telephony is currently the fastest growing within the telecommunications sector. With only two players in this market a third operator will create an opportunity for maturity of the market. On the other hand Kenya has a limited computer assembly market, which has been awash with undocumented imports with response to high tariffs. On the other hand Internet use is rapidly growing with over 30 licensed ISPs and has one of the largest Internet users in Africa. Despite the fact that Kenya is still behind other developed nations in promoting the Internet, e-commerce has continued to progress in tourism, manufacturing and insurance even with the limited use of credit cards.

A firm's position in the marketplace depends critically on the characteristics of the industry environment in which it operates. The industry environment comprises structure, conduct and performance. Structure refers to economic technical perspectives of the industry in the context in which the firms compete. It includes industry concentration, entry barriers and product differentiation. Conduct, which is essentially a strategy, refers to the firm's behavior in such matters as pricing, advertising and distribution. Performance on the other hand is measured in terms of allocative efficiency (profitability), technical efficiency (cost minimization) and innovativeness.

From what has been reviewed, what comes out clearly is that more studies need to be done in telecommunications in Kenya. It is important at this juncture to point out that the literature reviewed is mainly global and very few from Kenya. Even from Telkom Kenya, the major player in the sector adequate information was lacking.

There is a general need to recognize that the efficient management of the telecommunication services is crucial for economic growth. Policy makers in this sector therefore require accurate information on the history and trends of telecommunications in Kenya. This study provides a historical background, current status and projected trends in the telecommunications sector. It will therefore form a basis for further study besides assisting policy formulation in service delivery and improvement.

## 3.0: RESEARCH METHODOLOGY

### 3.1 Conceptual Model

The number of sellers is one of the major determinants of the structure of a particular market or industry. The number and size distribution of firms in a market is called the degree of concentration in the market. According to Gottheil (1999) concentration ratio is the ratio of total sales of the leading firms in an industry (usually four) to the industry's total sales.

The performance of a market in attaining objectives such as efficiency, full capacity, stability and progressiveness depends on the conduct of the participants as well as on concentration. According to Fourie (2001), the concern of governments and other interested parties over business concentration stems from the neo-classical structure-conduct-performance (SCP) theory. According to this theory, market structure influences the conduct or behavior of market participants, which in turn affects the performance of the market. In many countries SCP theory has led to the adoption of measures aimed at regulating or limiting market concentration and stimulating competition as there are many are many firms to share the market.

The Kenya's telecommunications industry is characterized by a variety of market structures. For instance the fixed line business is purely monopolistic while the mobile cellular phone is duopolistic. This is because of the large sums of money required, entry barriers are high and as large firms, they can benefit from integrated distribution network. Therefore Kenya's case is that of pure monopoly, pure duopoly and unbalanced oligopoly.

Virtually all-previous studies in this field used macroeconomic statistics and sought, only with limited success, to demonstrate a cause and effect relationship between the expansion of public telecommunications network and economic growth, using data on broad economic trends. The CSP/ITU (1987) study shows that a minimum threshold requirement for telecommunication services was being met and therefore substantial gains could be made from a higher investment in network infrastructure and service provision.

Past studies have mainly a single variable sales revenue, capital investment, and contribution to GDP etc. to measure the growth trends in telecommunications. This study intends to use a combination of variables, which affect telecommunications growth in general and then try to measure the contribution of each independently. The study will explain the relative importance of each explanatory variable and there determine the most significant variables in determining telecommunications growth.

## 3.2 Empirical Model

A microeconomic approach is adopted to assess the impact of competition on telecommunications industry in Kenya since liberalization. We begin by defining liberalization as the removal of controls over economic activity that has been imposed by the government or a regulatory body. On the other hand competition is defined as the process whereby firms strive against each other to secure customers for their products or services. In this study we will use liberalization and deregulation interchangeably.

This study will use econometric methods to measure the effects of competition in the telecommunications sector and will examine the effects of liberalization on the performance of the telecommunications sector. Because of the complex nature of the

industry, it is difficult to incorporate all the growth variables in the model. For this reason the model specified for this study focuses mainly on the growth factors affecting the fixed line telephony as:

**TG = f (C, Po, XM, N, R, LD)**                    **(1)**

Where:

TG = telecommunications growth (measured in number of lines in the country)

C = income per capita

Po = population growth

XM = openness of the economy measured as (exports + imports)/GDP

N = number of operators licensed

R = volume of business measured in revenue (Ksh)

LD = deregulation dummy

However the model may suffer from several limitations:

(1) In sales revenue for example, it might not be able to capture the effect of inflation as increased sales revenue values may be mainly as a result of inflation. To reduce this effect all prices are based on 1982 prices as the base year.

(2) The openness of the economy may not be able to capture what volume of trade is directly related to telecommunications.

(3) Even as we consider more than one operator, nearly all telecommunications traffic terminate in the Telkom Kenya infrastructure. Therefore Telkom still holds the backbone of telecommunications infrastructure in Kenya.

In addition to the dependent variables TG, sales revenue R may be used to capture growth in telecommunications. Thus, the following two models were estimated:

$$log \ TG = \alpha_0 + \alpha_1 log \ C + \alpha_2 logPo + \alpha_3 log \ XM + \alpha_4 logLD \qquad (2)$$

$$log \ R = \beta_0 + \beta_1 log \ Po + \beta_2 \ logXM + \beta_3 logLD \qquad (3)$$

Conventional measures of the impact of liberalization on telecommunications industry can provide evidence of increased volume of business (R) measured in terms of increased revenue and the number of operators licensed (N). To ensure that the sales figures are adjusted for inflation, we use these values based on 1982 as our base year. In our equation, deregulation is a dummy variable. We anticipate that there will be a significant change in sales and improved teledensity after liberalization.

According to Leyland Kenya, the fixed line drivers include; economic upswing, Internet growth usage and telecommunication liberalization. On the other hand the growth drivers in the cellular mobile phone include; availability of substitutes, rapid economic development, competition, strategic partners and Global System for Mobile Communications (GSM) roaming. In the telecommunications sector the growth indicators include; household per telephone, towns with telephone service, payphones per inhabitant per main line, and distance from the telephone.

Since the research involves several interrelationships between variables, we will parameterize linear statistical models:

$$Y = x_1\beta_1 + x_2\beta_2 + \ldots\ldots\ldots + x_k\beta_k + e$$
$$= x\beta + e$$

Where;

Y = is a dependent random variable, e.g business volume, variety of services etc.

β = are the parameters to be estimated.

x = is the set of explanatory variables.

Since we intend to measure the overall impact of liberalization on telecommunications sector we will separate the time period into two parts. The first part covers 1982 – 1998 (the period before the Kenya Communications Act 1998) and the second period covers 1999 to 2002 (the period after the Kenya Communications Act 1998). A time trend beginning in 1982 will be included in the model to capture this effect both before and after liberalization.

## 3.3 Research Design

Economists have always been interested in potential growth factors in the economy. The various elements of economic growth interact in a complex manner and the role of telecommunications in this process is difficult to determine. The study mainly used telecommunication growth determinants such as income per capita, openness of the economy population growth and liberalization. Investment as major determinant of telecommunications growth is however difficult to capture because of lack of data.

The study used an exploratory research design as it is concerned with finding out the general trend of telecommunications growth and hence its determinants. The study therefore mainly used secondary data from published statistics extracted from government publications at the Central Bureau of Statistics (CBS). The main area of study was mainly in the fixed telecommunications as nearly all other telecommunications services depend on it.

## 3.4 Data Collection Method

In order to achieve its objectives the research utilized both descriptive analyses and simple econometric techniques. Time series data for the last 20 years were obtained from published telecommunication documents. This period was chosen because it is a transitional period when the industry experienced transformation from pure monopoly to partial liberalization where competition was experienced. This data will therefore be obtained from formerly KP&TC and now Telkom Kenya annual reports, documents from the CCK, ITU country reports and published economic documents from the Central Bureau of Statistics.

## 3.5 Data Analysis Technique

The general linear model assumes that data are stationary. A stochastic process $\{X_t\}$ is said to be stationary if the means and the variances of the process are constant over time and if the value of the covariance between the two periods depend on the gap between the periods and not the actual time. If one or more of the conditions above are not fulfilled, the process is non-stationary (Cheremza and Deadman 1992). A non-stationary series which can be transformed to a stationary series by differencing d times is said to be integrated of order d, denoted as I[d].

An appropriate method for testing whether a variable is integrated of order one is the DF test proposed by Dickey and Fuller (1979). The DF testing procedure is used to determine whether or not the OLS residuals are stationary with no drift or trend. Suppose the variables X and Y are I[d]. In general any linear combination of X and Y will also be integrated of order d and a long run relationship exists if the errors in the model:

$$y_t = y_t + \alpha + \beta x_t + e_t, \text{ are stationary.}$$

As e is unobservable, we test for stationarity of the OLS residuals:

$$e_t = y_t - a - bx_t,$$

Where a and b are both estimates of $\alpha$ and $\beta$.

The DF test is used to test the null hypothesis that the time series exhibits a lag d, against the alternative hypothesis of stationarity, i.e.

$H_0$: $\beta = 0(Y_t \sim I[1]$   or  (e displays a unit root.)

$H_1$: $\beta < 0( Y_t \sim I[0]$   or (e does not display a unit root.)

Rejection of the null hypothesis in favour of the alternative implies that $\alpha$ is less than 1 and $Y_t$ is integrated of order 0.

The DF model may suffer from autocorrelation in the residual process if OLS regression technique is applied since the errors may not be normally and identically distributed (NID). The residual variance estimates will be biased. The Augmented Dickey-Fuller test solves this problem by involving lagged left-hand side variable as additional explanatory variables to approximate autocorrelation. In this case we would have an equation of the form:

$$Y_t = \beta Y_{t-1} + \Sigma\Pi Y_{t-1} + e_{t-1}\beta \ldots\ldots\ldots\ldots$$

The hypothesis being tested is:

$$H_0: \ \beta = 0$$
$$H_1: \ \beta < 0$$

The test can be used to test the order of integration for a variable generated as a stochastic process with a drift and /or deterministic trend.

## 3.6 Testing for Cointegration

The general linear model assumes data are stationary. In general we should apply the appropriate level of differencing to integrated data before estimation, unless the data have a common trend in which case we say the data are cointegrated. The concept of cointegration implies that if there is a long-run relationship between two or more non-stationary variables, deviations from this long run are stationary.

Variables are said to be cointegrated if they are integrated of the same order and if a linear combination of these variables assumes a lower order of integration.

Let $X_t$ denote a 1 x k vector of observations on k time series.

$$X_t = [ X_{1t}, X_{2t}, \ldots\ldots\ldots\ldots\ldots X_{kt}]$$

If each $X_k$ series is integrated of order d, there exists a vector $\beta$ such that $X_t\beta$ is integrated of the order (d-c), then X is cointegrated of (c,d); CI(d,c).

Testing for cointegration involves two steps:

I.    Testing for the order of the variables involved in the postulated long-run relationship. If they appear to have a unit root, then a model based on these variables (Non-stationary) in levels is estimated by OLS to obtain the residuals.

II.   Testing for stationarity (order of integration) of the residuals generated in the step (I) above. If stationarity is not rejected, formulate an error correction model (ECM).

The DF and ADF test procedure for evaluating the order of integration are based on the estimation of the equation:-

$$\Delta e_t = \beta e_{t-1} + V_t$$

The hypotheses to be tested are:

$$H_0: \beta = 0 \text{ (No Cointegration)}$$
$$H_1: \beta < 0 \text{ (Cointegration)}$$

The t statistic of the coefficient of $e_{t-1}$ using both version of DF and ADF test will be used to determine whether the variables are cointegrated or not. If the computed t-value is greater than the critical t, then cointegration is accepted.

The research will use Ordinary Least Squares (OLS) technique. OLS is chosen because it is fairly simple and straightforward and therefore able to explain the effects on one variable resulting from changes in other variables. As the research will use time series data, we will be able to estimate the parameters of sales, profit and other performance indicators influenced by liberalization. OLS will do this through minimization of the vertical sum of squares deviations from the line of best fit.

# 4.0 EMPIRICAL FINDINGS

## 4.1 Sample Statistics

In this section, we give a summary of the main variables that have been used in the estimation of the model. The sample mean of variables and their respective standard deviations are as shown in table 4.1. Also determined were the minimum and the maximum values the variables.

Table 4.1: **Sample Statistics**

| Variable | Mean | Std. Dev. | Min. | Max. | Skewness |
|---|---|---|---|---|---|
| No. of telephone lines (TG) | 209147.9 | 79758 | 88218 | 337948 | 0.054 |
| Population (PO) | 26.639 | 5.320 | 18.30 | 35.40 | 0.042 |
| Income per Capita (C) (Ksh) | 171.240 | 7.192 | 157.26 | 168.10 | 0.380 |
| % (Exports +Imports)/GDP | 47.1 | 0.061 | 0.37 | 0.54 | -0.494 |
| Revenue (million Ksh.) | 58.021 | 32.550 | 11.20 | 100.70 | -0.092 |

Dummy variable (LD) = 1 for the period 1998- 2002, and zero otherwise.
Sample size = 21

The table also reports the tests for normality of variables using skewness. Skewness characterizes the degree of asymmetry of a distribution around its mean. The results show symmetry in telecommunications growth (TG), population (PO) and revenue growth (R) all deviating from their expected values with normal distribution. However, asymmetry was depicted on income per capita (C), which was positively skewed, and openness of the economy (XM), which was negatively skewed.

## 4.2 Estimation results

The regression of the data by OLS showed the following results as indicated by tables 4.2 and 4.3.

Table 4.2: **Regression Results for Model 1 (dependent variable is log number of telephone lines, TG)**

|  | Coef. | Std. Error | t-value | 95% Conf. Interval | |
|---|---|---|---|---|---|
| Log of income per capita | 5.858 | 1.30791 | 4.4 | 3.098 | 8.617 |
| Log of (XM) exports+imports/GDP | 0.1237 | 0.40883 | 0.30 | -0.738 | 0.986 |
| Constant | -17.991 | 6.6391 | -2.71 | -31.998 | -3.983 |

Deregulation Dummy (LD) = 1 for the period 1998 – 2002, and zero otherwise.

$R^2 = 0.7417$    $F(3, 17) = 16.27$
Adj. $R^2 = 0.6961$    $Prob > F = 0.000$

Table 4.3: **Regression Results for Model 2 (dependent variable is log revenue R)**

|  | Coef. | Std. Error | t-value | 95% Conf. Interval | |
|---|---|---|---|---|---|
| Log of Population | 3.9620 | 0.2335 | 16.98 | 3.4697 | 4.4543 |
| Log of (XM) exports + imports/GDP | 0.24235 | 0.2585 | 0.94 | -0.3031 | 0.7878 |
| Constant | -8.79844 | 0.7475 | -11.77 | -10.375 | -7.221 |

Deregulation Dummy (LD) = 1 for the period 1998 – 2002, and zero otherwise.

$R^2 = 0.9613$    $F(3, 17) = 140.92$
Adj. $R^2 = 0.9545$    $Prob > F = 0.000$

From the analysis $R^2$ (coefficient of determination) equals to 0.9613 for model 1 and 0.7417 for model 2. This indicates that the model explains a high percentage of the variations in the dependent variables TG (growth in telecommunications) and R (revenue from telecommunications).

The F statistic tests the hypothesis that $\alpha_1 = \alpha_2 = \alpha_3$ and $\beta_1 = \beta_2 = \beta_3 = 0$. That is all the independent variables together are not useful in predicting the dependent variable. In the models F = 140.92 for model 1 and 16.27 for model 2, which indicates that the $R^2$ is statistically significant. That is, considered together the explanatory variables affect the performance of the telecommunications industry.

For model 1, income per capita (C) with a coefficient of 5.858 is the most important predictor of telecommunications growth (TG). It shows that a one percent increase in per capita income (C) leads to 5.86 percent increase in the telecommunication lines in the country. The coefficient of openness of the market (XM) is also positive, indicating that as the economy becomes more open, the telecommunications sector grows.

For model 2, population change with a coefficient of 3.962 is the most important predictor of revenue growth. It shows that a one percent increase in population increases the revenue of the telecommunications firms by 3.96 percent. The coefficient of openness of the economy (XM) is 0.242, which suggests that openness of the economy increases the revenue of the industry. For both models, the t-ratio indicates that at 5 percent level, the estimated coefficients are statistically significant.

## 4.3 Unit Root Results

This test was necessary because time series data requires some transformation failure to which the problem of non-stationarity will arise, and the estimated effects may be spurious. The problem of non-stationarity arises in two ways. The variable in question can have a deterministic trend or a stochastic trend. The difference between the two is that with a deterministic trend, the growth of the variable can be predicted with certainty, which can be linear or polynomial, but for a stochastic trend, the growth of the variable cannot be predicted with certainty.

This study utilized the unit root test to test for non-stationarity. Since the DF test does not take into account the possibility of having residual that are autocorrelated, we use the ADF test. This test is identical to the DF test but is constructed within a regression model.

Before transformation of the variables the following estimation results were obtained:

Table 4.4: **ADF Tests of Variables in Levels for Model 1 (Dependent variable is telecommunications growth)**

| Variable | Cointegration | ADF | Order of Integration |
|---|---|---|---|
| Population (Po) | -3226.38 | 50.34 | 1(1) |
| Openness of the economy (XM) | 3423.59 | 45.92 | 1(1) |
| Deregulation dummy LD | 2855.43 | 56.41 | 1(1) |

ADF Critical values at 5% level of significance

**Table 4.5: ADF Tests of Variables in Levels for Model 2 (Dependent variable is Revenue)**

| Variable | Cointegration | ADF | Order of Integration |
|---|---|---|---|
| Per capita income C | 243.493 | 42.3 | I(1) |
| Openness of the economy XM | -3346.54 | 27.8 | I(1) |
| Deregulation dummy LD | 2815.18 | 49.4 | I(1) |

ADF critical values at 5% level of Significance

The results indicate that the levels of all the variables tested are non-stationary at 5 percent level of significance. Hence since differencing once produces stationarity, we can safely conclude that the series is integrated of order one i.e. I(1). Therefore the stationarity tests show that all the variables are difference stationary and become stationary on differencing.

# 5.0 SUMMARY AND CONCLUSION

## 5.1 Summary

Telecommunication services constitute an important part of the production infrastructure and as such contribute to the generation of national income. During the past decades, however, Kenyan plans have mainly focused on other areas of development such as agriculture, roads, tourism etc. with little attention on telecommunications. As a consequence the telecommunication industry has found it more and more difficult to meet demand in terms of quantity and quality of services.

The inadequacy of telecommunication services due to the low number of telephone lines, unutilized capacity in Telkom's exchanges, lack of access network, frequent failure by the Internet gateway (Jumbo Net), etc is increasingly hindering the efficient work of other sectors of the economy. These deficiencies in the communications systems are having a negative impact on many businesses, as communications services are critical for a modern business environment.

Fixed line telecommunication services are supposed to be the bedrock of Information Communication Technology (ICT) development in any country. However, in Kenya, 65% of this network is resident in Nairobi and Mombasa, leaving the rest of the country to share the remaining 35%. This imbalance should be addressed as a matter of priority if the telephone penetration targets for the rural areas are to be realized.

Although Kenya is ranked highly in Africa in terms of absolute number of internet users, its internet penetration is not growing as fast as those of other African countries. The government should seek to address such key barriers to

internet such as excessive pricing of international bandwidth, access to fixed telephone lines, the cost of computers, and a responsive and dynamic regulatory framework.

In modern societies, telecommunications have long been indispensable tools for industries. For an industry, it is not a question of whether telecommunications should be acquired or not. That decision has already been taken. General motives for telecommunications investment refer, rather, to the acquisition of extended and advanced telephone services, telex, facsimile, data communications and various forms of integrated services. Several reasons for investing in telecommunications include:

- It is a precondition for the international division of labor. The importance of telecommunications is growing not only because of the growth of world trade but also because it is the means for real-time synchronization between various kinds of activities of industrial enterprises (Research and Development, design, manufacturing, warehousing, sales management, administration etc) which are often dispersed not only nationally but also on a world wide basis e.g. based on market information, excess demand and supply can be evened on between various markets.

- It facilitates the realization of economies of scale as advances in telecommunications make large scale decentralization possible by providing access to information and experience stored elsewhere and allowing remote control of production and data processing.

- It can lead to higher labor productivity and lead to reduced requirement of capital. As a result of a faster and more efficient co-ordination of various activities, it is possible to obtain a higher degree of utilization of input factors. The workforce can be better organized and other

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supporting services such as transport are not only better coordinated but also made to respond faster to changes in market demand. In cash management and financial transactions, the availability of reliable and advanced telecommunications are even more indispensable.

- It changes the patterns of consumption - telecommunications affect not only the consumption of durable goods but also the provision of new services and the manner of their provision.

## 5.2 Policy Recommendations

In the interest of correcting this unfavorable situation, the government during its plans should accord high priority to the development of telecommunication with the aim of:

- Restructuring the whole sector and freeing it from the politics of the day, which will enable the economic forces to help rationalize the industry.
- Improving equipment, networks and establishments should be reconstructed and modernizing digital telecommunication systems installed to ensure the availability of an efficient, reliable and affordable telecom services.
- Increasing the number of telephone lines both in urban and the rural areas.
- Increasing investment in the telecommunications sector both in terms of capital and technology.

Industry analysts have welcomed the liberalization of telecommunications in Kenya as a step in the right direction. Business and customers have complained over the years that telecommunications monopoly affects the quality of international and domestic calls and slows down the advance of investment in Kenya. Unreliable fixed line services have led to a boom in mobile phone use. More operators should be licensed to compete with Telkom Kenya as this would not only increase telephone penetration levels, but also the efficiency of service. This would translate into reliable and affordable service if the country is to achieve its telephone density targets of one line per 100 people and 20 lines per 100 people in the rural and urban areas respectively.

Stakeholders should be involved particularly from civil society and the commercial sector ensures availability of efficient, affordable and reliable telecommunications sector, which will also attract capital from the private sector. Again a level playing ground for competitors in the market should be ensured and entry barriers lowered to ensure competitive entry. This can be done by:

- Establishing and enabling regulatory environment for telecommunications in Kenya.
- Facilitating the adoption of the latest and the most cost effective technologies.
- Ensuring local commercial interests are not compromised by direct foreign investments even when we encourage foreign investment in the sector.

## 5.3 Conclusion

The success of telecommunication development in Kenya depends on the willingness and ability of governments to provide regulatory and legislative environment that promotes the development of telecommunications infrastructure and service offerings. The government is becoming aware that shifting the burden of infrastructure management and investment to private firms can be beneficial, in terms of increased efficiency in this sector and also with respect to the possibility of securing additional private investments in other economic sectors of the economy.

As the country privatizes telecommunications operations, the regulators need to implement incentive schemes that will guarantee increased service quality as well as higher penetration levels. One way to ensure efficiency is to encourage competition. The next step in the privatization process is to start thinking about how best to encourage competition and how much competition should be allowed. Competition is not always feasible but the economic consensus is that competition in services such as cellular telephony improves infrastructure development. Countries planning to privatize should have clear goals and policies since clear and precise information is attractive to potential entrants.

The increasingly competitive market has challenged the telecommunications operators to focus both on economy and flexibility in meeting subscriber requirements. This means that network planners face new and extremely complex tasks whose accomplishments require assistance of more and more highly developed technology. Again increased data traffic and customer demand for new services means that network operators must be able to provide

high quality, flexible transport capacity with speed and economy. They must also respond to increased requirements for network transmission security.

Deregulation reflects a recent and a widely held view among economists and governments that the regulations imposed over the years for many industries such as banking, energy, transportation and communications have become obsolete and in some instances even counterproductive. As a result a movement towards deregulation in many parts of the world is taking place.

But the dismantling process has never been seen as a miracle cure for the problems associated with regulated industries. Nor was there any intention of wiping regulation entirely out of government or allowing a return to monopoly pricing. Industry concentration is still viewed by many economists as a serious economic problem, and the use of regulation to control pricing and output in concentrated industries is still regarded as legitimate and effective. This is because high concentrated industries may result in monopolistic tendencies, which may lead to consumer exploitation.

To take advantage of possible effects competition, regulators must guarantee appropriate interconnection agreements between competitors and Telkom Kenya. Both parties must be clear on matters such as points of interconnection, cost responsibilities and pricing. This is because telecommunications sector performance is a function of regulatory governance, incentives, competition, ownership and political stability.

The policy pursued by the government will to a great extent determine whether Kenya is going to become e-relevant or e-absent. It should shift its energies from suppressing telecommunication entrepreneurs and innovators and focus on stopping the exploitative tendencies of Telkom Kenya and create a conducive environment for investment in this sector.

## Appendix 1 Tables

### Appendix Table A: **Sample Data**

| Year | No. of telephone lines | Population in millions | Income per Capita in Ksh | (Exports imports)/GDP | Revenue in Million Ksh. |
|------|------------------------|------------------------|--------------------------|------------------------|-------------------------|
| 1982 | 83318  | 18.30 | 157.26 | 0.54 | 11.20  |
| 1983 | 96017  | 19.05 | 161.86 | 0.48 | 15.00  |
| 1984 | 104552 | 19.82 | 162.38 | 0.51 | 17.90  |
| 1985 | 117071 | 20.62 | 164.61 | 0.51 | 22.60  |
| 1986 | 128868 | 21.44 | 167.62 | 0.53 | 26.10  |
| 1987 | 143705 | 22.28 | 169.66 | 0.54 | 27.40  |
| 1988 | 156402 | 23.12 | 172.34 | 0.41 | 24.50  |
| 1989 | 169506 | 23.98 | 174.77 | 0.37 | 32.30  |
| 1990 | 182378 | 24.84 | 176.51 | 0.39 | 39.80  |
| 1991 | 198912 | 25.70 | 175.98 | 0.38 | 53.10  |
| 1992 | 212939 | 26.57 | 171.97 | 0.37 | 61.00  |
| 1993 | 217844 | 27.46 | 167.01 | 0.54 | 79.00  |
| 1994 | 229314 | 28.35 | 168.10 | 0.50 | 72.60  |
| 1995 | 247673 | 29.24 | 170.60 | 0.54 | 83.60  |
| 1996 | 263908 | 30.14 | 186.65 | 0.53 | 83.80  |
| 1997 | 274199 | 31.04 | 185.60 | 0.49 | 98.50  |
| 1998 | 279807 | 31.92 | 177.50 | 0.45 | 100.70 |
| 1999 | 297217 | 31.92 | 176.35 | 0.49 | 96.30  |
| 2000 | 314307 | 33.68 | 171.24 | 0.46 | 93.67  |
| 2001 | 331222 | 34.54 | 170.00 | 0.46 | 88.54  |
| 2002 | 337946 | 35.40 | 168.10 | 0.40 | 90.83  |

Source: Government of Kenya Annual Reports;
  Central Bureau of Statistics

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