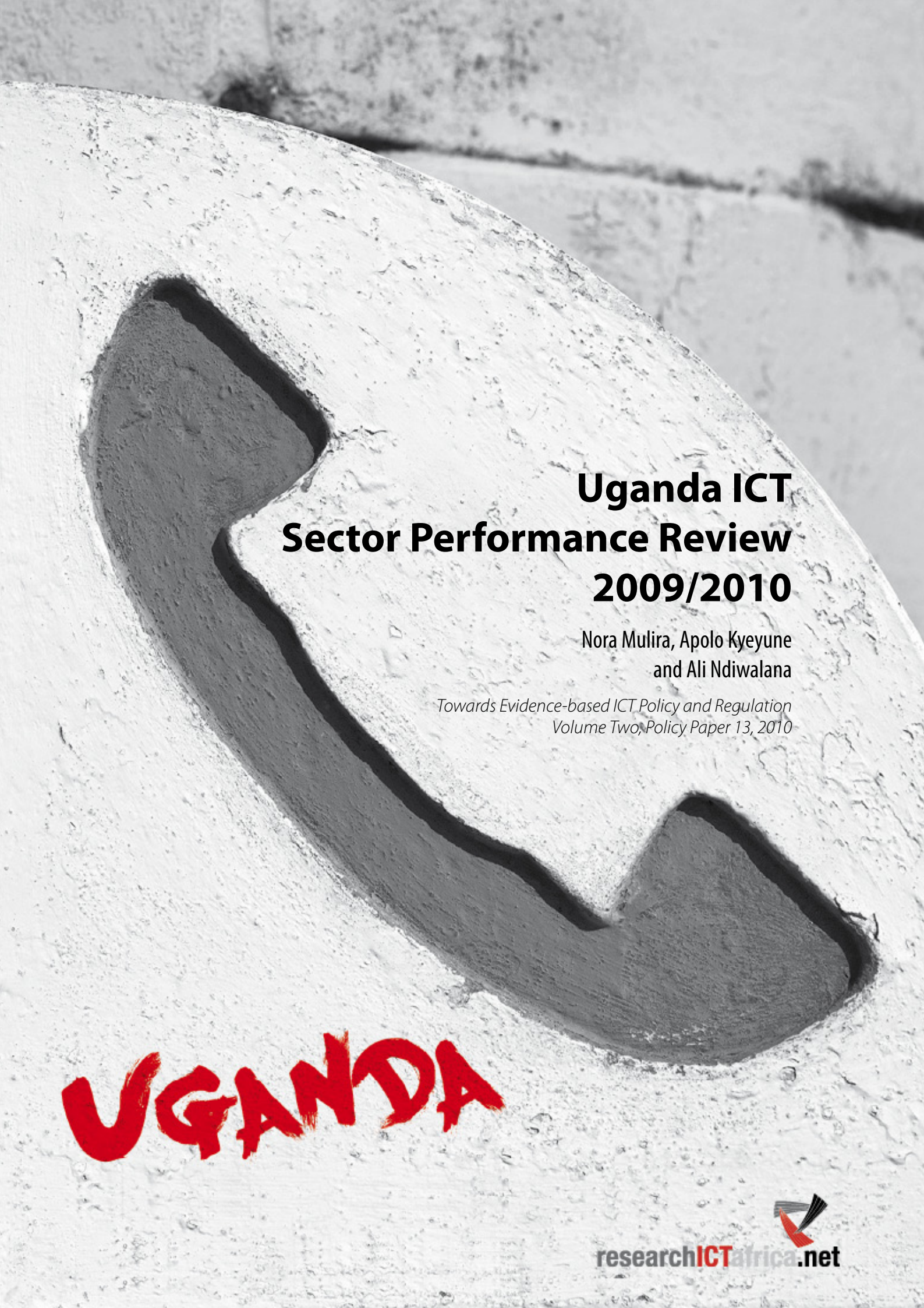

Uganda ICT Sector Performance Review 2009/2010

Nora Mulira, Apolo Kyeyune
and Ali Ndiwalana

Towards Evidence-based ICT Policy and Regulation
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Research ICT Africa

Research ICT Africa fills a strategic gap in the development of a sustainable information society and network knowledge economy by building the ICT policy and regulatory research capacity needed to inform effective ICT governance in Africa. The network was launched with seed funding from the IDRC and seeks to extend its activities through national, regional and continental partnerships. The establishment of the Research ICT Africa (RIA) network emanates from the growing demand for data and analysis necessary for the appropriate and visionary policy required to catapult the continent into the information age. Through network development RIA seeks to build an African knowledge base in support of ICT policy and regulatory design processes, and to monitor and review policy and regulatory developments on the continent. The research arising from a public interest agenda is made available in the public domain, and individuals and entities from the public and private sector and civil society are encouraged to use it for teaching, further research or to enable them to participate more effectively in national, regional and global ICT policy formulation and governance. This research is made possible by the significant funding received from the International Development Research Centre (IDRC) Ottawa, Canada. The network members express their gratitude to the IDRC for its support.

The network is based in Cape Town under the directorship of Dr. Alison Gillwald. RIA members are Dr. Augustin Chabossou (Benin), Dr. Patricia Makepe (Botswana), Dr. Pam Zahonogo (Burkina Faso), Dr. Olivier Nana Nzèpa (Cameroon), Prof. Dr. Arsene Kouadio (Cote d'Ivoire), Dr. Lishan Adam (Ethiopia), Dr. Godfred Frempong (Ghana), Dr. Tim Waema (Kenya), Francisco Mabila (Mozambique), Dr. Christoph Stork (Namibia), Dr. Alison Gillwald (South Africa), Prof. Dr. Ike Mowete (Nigeria), Albert Nsengiyumva (Rwanda), Prof Dr Abdoulaye Diagne (Senegal), Dr. Bitrina Diyamet (Tanzania), Dr. Farouk Kamoun (Tunisia), Dr. Nora Mulira (Uganda), Shuller Habeenzu (Zambia).

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Makerere University
DIRECTORATE FOR ICT SUPPORT

Executive Summary

Uganda embraced the opportunity presented by the end of the exclusivity period to further expand its strategy of sector improvement through increased competition. Despite having the same 1996 telecom policy, an absent postal policy and the same communications act, Uganda has managed to establish a fully liberalised sector.

The new Ministry of ICT and the regulator are striving to set up the necessary environment to foster healthy competition in the sector after the recent growth in the number of licensees (33 as at December 2008). These measures include a decision by the regulator to establish a cost-based price control in interconnection rates. However, the communication tribunal continues to be absent.

The Uganda Communications Commission also continues to execute the rural communications development program, which, it is hoped, shall compliment operators' expansion plans to achieve the overarching objectives of the sector.

Rewards deriving from increased competition are already visible in the substantial growth of the market over the past few years

Rewards deriving from increased competition are already visible in the substantial growth of the market over the past few years, with increases in both subscribers and traffic. By December 2008, there were reportedly 8.5 million mobile subscribers in the country. Tariffs of services have also declined substantially, with numerous promotions offered to attract customers in the highly competitive environment. The growth trend is expected to continue over the next few years. However, despite growth, market leadership in terms of the dominance of MTN Uganda Limited in the mobile and Uganda Telecom Limited in the fixed markets has not changed, with only a drop in market shares observed.

There is extensive coverage of the voice network (especially GSM) in the country. With the increase in competition, technologies like CDMA EV-DO, WiMAX and 3G/UMTS have also emerged in the market. The coming of the submarine cables to the East African coast (SEACOM, TEAMS and EASSy) promises greater affordability of Internet access and in turn, an increase in use of the Internet in Uganda. In the case of the backbone, this is still majorly microwave based. However, initiatives such as the national data backbone infrastructure and backhaul connection for submarine cable access by the two national telecom operators, as well as the electricity transmission company making commercially available its spare capacity promise a change in this. There is now significant optical fibre deployment along the southern corridor of the country.

The developments in the sector have also spurred innovation, with growth in short messaging service (SMS) applications including mobile banking and mobile payment applications as well as numerous information-availing applications in finance and even education.

The combined growth in the sector has also led to an increase in the need for skilled human resources, leading to various capacity-building initiatives. The importance of capacity building has been recognised by Government and as such given prominence in the national ICT policy. The education ministry has also developed an ICT program whose main challenge is resources like the hardware required. However, a good investment climate and competition safeguards that are enforced are necessary if Uganda is to reap the full benefits of competition.

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Introduction

The increase in the number of operators in the various market segments within the telecommunications sector has thrown a spanner in the works, disturbing regulatory and competition frameworks/approaches that worked well during the exclusivity period. The focus has therefore shifted to reviews of regulatory approach towards facilitation of healthy competition in the sector. This report examines the status quo.

National Indicators

Indicator	Data
Country	Uganda
Population (million)	32,369,558 (2009 est.)
Poverty (% of population below $1 a day)	35%
Adult literacy rate (%, ages 15 and over)	74% (2000 - 2007)
Urban population (% of total population)	15%
GDP per capita (US$) – at current prices	1,100 (2008 est.)
Surface area (000 km^2)	241,000 km^2
Uganda Shilling / US$)	2050 (2009)

Policy and Regulatory Issues

Policy

Despite the immense and wide stakeholder review of the telecommunication policy in 2005, a new telecommunications policy is yet to be announced. The prevailing policy is still that issued in the 1996 Ministerial Statement, whose targets were long since achieved. This notwithstanding, strategies to do with issues such as the licensing regimes, that were recommended in the 2005 proposed policy to achieve the objectives therein, were embraced (and therefore not lost) through the ministerial policy guidelines issued by the respective communication ministers in 2006 (April 2006 and October 2006). Other strategies have also been picked up by other programs under government and the Uganda Communications Commission (UCC), as detailed in later sections of this report. An ICT ministry was also created in 2006 as recommended in the policy document.

Despite the immense and wide stakeholder review of the telecommunication policy in 2005, a new telecommunications policy is yet to be announced.

It is not certain when a new sector policy will be announced (especially with changes once again in the minister responsible for the sector) but this may be an opportunity instead to review and update the 2005 proposals in light of developments in the sector and the fact that 2010 was the year that was initially set for review of the policy.

Legal

The legal framework is still provided by the Uganda Communications Act, Cap 106 Laws of Uganda (the Act), which was enacted in 1997 to facilitate the implementation of the 1996 policy. Despite this, it remains highly relevant to the current licensing regime, with the only significant area that needs to be reviewed being the distinction between major and minor licences[1]. This distinction was based on the earlier status of voice services provided over fixed telephony networks, and cellular services have since been overtaken by developments in technology that enable provision of the various traditional services over simple networks not envisaged at the time. As a result, all licences under the new licensing regime, whatever their scale of operation, are issued by the minister responsible for communication since they qualify as major licences.

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Convergence is yet to be addressed on the side of the governing law and regulation despite the creation of a converged ministry. It has been mentioned that Cabinet approved the direction of a merger of the regulatory bodies and this is expected to happen within the next year or two. This will of course necessitate the enactment of a new governing ICT law.

One provision in the law that has never been effected twelve years on is that referring to the establishment of an appeals tribunal. Reasons provided for this include a lack of guarantee of sufficient cases to justify continuous existence of the tribunal in light of funding and other requirements of the tribunal.

Regulation

The regulator (UCC) has been granted by law a number of powers, including arbitration of disputes, institution of levies on gross annual revenue of operators, confiscation of apparatus, institution of inquiries and imposing fines for various breaches like illegal operations and breach of licence. The UCC has employed these (although minimally in the case of imposition of fines) in the execution of this mandate. It is not clear why the UCC hasn't really utilised its power to impose fines. In fact, some may argue that the UCC has, over the years, grown 'soft' on dealing with violations by operators. This perceived softness of the UCC is, of course, likely to impact on the level of compliance in the sector and subsequently affect investment.

[1] This poses a question as to how detailed the law should be in light of how long it takes to amend a law.

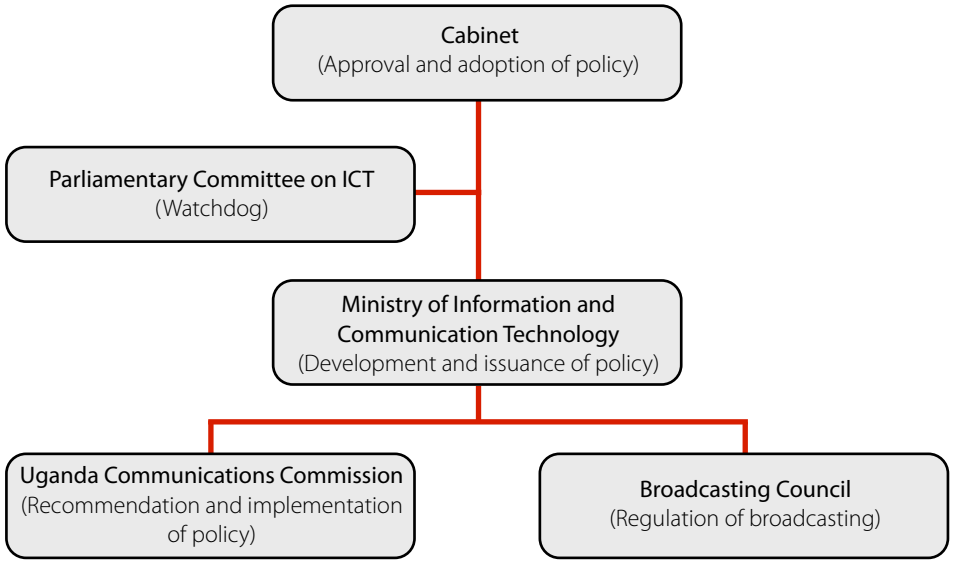


Figure 1: Policy framework in Uganda

The nature of the working relationship (independence) between the regulator and the Ministry has over the years been dependent on the sitting minister. Of course, as has been continuously argued, the question should be asked whether independence from government can be guaranteed if the UCC is accountable to Parliament, and if its budget is approved by the Minister. The Act does give the Minister power to issue guidelines on policy to the UCC and likewise, the UCC to advise Minister on policy. The question remains as to what then constitutes policy guidelines, and therefore to what level the Ministry should be involved in ordinarily regulatory decisions.

Vertical integration was viewed as limiting to competition and, as such, licensing is now horizontal, separating the licensing of infrastructure from service provision.

The new licence regime referred to above is a technology neutral one in that it gives freedom to the licensee to select technology of choice. Vertical integration was viewed as limiting to competition and, as such, licensing is now horizontal, separating the licensing of infrastructure from service provision. To encourage fringe businesses, UCC created two types of service licences, the first being the voice and data licence that can be seen as service neutral as it recognises the capability of technology today to provide both voice and data at minimal additional cost; and the second being the capacity resale licence for resell operations using capacity of other operators. This latter category accommodates providers of calling card services and Voice over Internet Protocol (VoIP) call termination providers.

With the full liberalisation of the sector, the entry of more players into the sector has introduced a fresh set of challenges to the regulator. The UCC is mandated to regulate interconnection and access systems between operators and users of telecommunications services. To this end, the approach taken by the UCC in regulation of interconnection has in the past been ex-post, allowing operators to enter into commercial agreements (cost-based or otherwise) and intervening only if such negotiations fail to result in agreement or if dispute arises. With the opening up of the sector to further competition, interconnection was being used by the incumbents to create barriers to entry, offer unattractive interconnection rates and refuse to give audience to smaller players.

With the opening up of the sector to further competition, interconnection was being used by the incumbents to create barriers to entry

There is also concern over wasteful duplication of infrastructure, heightened with the increase of operators in the sector. This concern has different angles, with some expressing fear over possible health effects from close proximity of masts (or more accurately, the transmitters) and others raising concerns relating to the degradation of skyline (beauty) and continuous destruction of facilities (e.g. roads). However, this also carries an economic angle due to the impact on take-off costs (associated with the level of sunken costs) and need to promote competition.

Although the incumbent licensees (specifically the National Telecommunications Operator [NTO] licences) do carry an obligation to provide leased lines to customers (including other operators) subject to available network capacity and within a maximum response time at rates approved by the regulator, leased lines have been a major bottleneck in competition due to rates offered to other operators. This has proved significant in the Internet market where the NTOs, especially Uganda Telecom (UTL), whose wired network is more widespread, offer bundled services (leased line with internet access) in the same market as the other operators (especially Internet Service Providers – ISPs) that sought leased lines to offer Internet access. The problem was exacerbated by the lack of capacity on the part of the UCC to dissect the actual cost information, especially for

long-distance leased lines. Local loop unbundling was not made a requirement in Uganda mainly because of the existence of substitute technologies to the not very extensive wired (copper and optical) last mile access. However, this last mile access is important to competition in the corporate customer market segment, which is the target among competing operators.

In recognition of these difficulties, the UCC decided that effective November 2009 it would adopt a cost-based price control of call termination and transmission capacity[2]. A bottom-up model was chosen under the incremental cost modelling approach of determination of interconnection rates[3].

The UCC is also to enforce accounting separation to address problems associated with wholesale leased lines provision. The implementation of these is to apply to facilities or infrastructure that may be designated by the UCC as being an essential facility. However, the regulator will still need to step up its capacity in order to effect and enforce these decisions.

number portability would further promote competition in the sector, forcing operators to improve their services

A number of people have come to believe that number portability would further promote competition in the sector, forcing operators to improve their services and offerings as well as allow new entrants to access corporate customers stuck to incumbent operators. The UCC has promised to direct the implementation of number portability in Uganda, citing the growth of mobile subscriber numbers to nearly ten million as sufficient. However, it continues to be argued that this ten million is significantly a result of persons with more than one mobile SIM card, many of whom carry multiple SIM cards because they wish to simultaneously enjoy the various offers from the different operators. It is therefore questionable as to the percentage of the market that actually wants number portability.

The technology neutral approach in licensing taken by the UCC implies that VoIP is no longer a grey area and is permitted. However, it remains to be seen if this approach (and therefore application of regulation used with traditional voice) will not hamper the development of the service in the country. It is noteworthy that PC (personal computer) to PC type VoIP (Skype, Instant Messenger etc.) is waived from any regulation as it is considered an application available over an already regulated service.

The growth in competition also poses the question as to whether the existing competition provisions in Uganda Communications Act Cap 106 Laws of Ugandaare sufficient or whether a competition law and competition authority are necessary. With the increased likelihood of issues like mergers and acquisitions, should the UCC be left to handle only matters related to economic regulation, or is it well placed to effectively deal with competition issues as well? It could be said that the latter is preferential in the face of resources required to set up another regulator but if so, it may then be time to change the style of regulation to a lighter-handed regulation or co-regulation approach.

Market Structure

over twenty-three infrastructure licences and thirty service licences have been issued

With the main limitation to entry being availability of scarce resources, especially spectrum, over twenty-three infrastructure licences and thirty service licences have been issued. However, most of these have not commenced operations. Table 1 shows those that are operational in the provision of the various types of services. UTL is still the dominant operator in provision of fixed telephony services while MTN Uganda Limited remains the dominant operator in provision of mobile telephony services. Despite technology neutrality, GSM is still the dominant mobile standard.

Due to the size of market versus the number of players, there is significant competition in a number of market segments. The high competition has left consumers in the market in a slightly stronger position with relation to the providers, with operators experiencing greater difficulty in attracting consumers to their services and consumers having grown more demanding in what they wish to receive in terms of service.

As mentioned above, the rationale for creating a distinction in licensing between service operations and infrastructure was to provide entry opportunities in the various markets as well as enable focus in development of infrastructure. This has enabled private network infrastructure (optical fibre) owned by the electricity transmission company to be made commercially available to the communication market.

[2] The Interconnection Cost Study project www.ucc.co.ug

[3] The implementation of this was delayed by a court injunction granted to MTN against the UCC.

Table 1: List of operational providers in the different market segments

Service type	Providers
Fixed telephony	UTL MTN Warid Telecom Smile Communications Uganda
VoIP telephony	Infocom Limited
Mobile telephony	UTL MTN Zain/Celtel Warid Orange Telecom i-Tel Limited
Internet access service	UTL MTN Zain/Celtel Warid Infocom Africa Online Afsat Datanet (Spacenet) Kampala Siti Cable TMP Uganda Ltd (Broadband Company) Tangerine Orange Telecom

Source: UCC

The two NTO licences previously issued remain valid. In the case of these licences, provision of services and infrastructure are permitted by the same single licence, unlike the other licences where both service and infrastructure licences have to be obtained in order to set up infrastructure. This difference is believed by some to be detrimental to the competition process in the sector. The implementation of accounting separation may therefore be critical to the promotion of healthy competition.

In addition, the NTOs only pay a levy on gross revenue while the new licence holders pay an annual licence fee as well as the levy. It may be argued that this is fair considering that the NTOs paid significant entry fees and were subjected to roll-out obligations, but they also had a five-year head start ahead of the latest entrants, and there is greater competition today reducing shares of available profits.

traditional ISPs, fixed telephony operators and mobile operators all hold the same licence

The implication of the new service licence categorisation is that traditional ISPs, fixed telephony operators and mobile operators all hold the same licence and can expand into each of these markets without having to revert to the regulator. As the boundaries between these markets become more blurred with advances in technology (VoIP, wireless fixed telephony etc.), this flexibility was believed to spur innovation and maximisation of capabilities of networks. It remains to be seen whether this will prove tantamount to a change in market definitions (e.g. voice service instead of a distinction based on mobility of the voice service or "service" versus "voice" and "data").

While the launch of mobile services by MTN in 1998, at under half the price that these were available from Celtel, led to a lot of substitution of fixed telephony by mobile services, the growing importance of Internet services was expected to reduce this level of substitution as people sought greater bandwidth. However, considering the level of use of Internet services in Uganda and the fact that in some cases, the same platform is being used to offer both kinds of service, this may not be realised especially in the case of the individual user/customer. Technology advancements like 3G/UMTS and LTE continue to fan this substitution but this is only so for a small fraction of the market, which will in many cases still require more than Internet access on the phone. The expected launch of CDMA EV-DO in the sector is also expected to throw a spanner in the works.

The infrastructure licence also permits construction of any form of infrastructure using any type of technology. This gives the holder flexibility to establish or set up any type of network or combination of networks (CDMA, optical, GSM, UMTS etc.) upon obtaining the necessary spectrum.

However, according to the UCC, there is no more spectrum available in the bands that have been opened up so far (especially in the popular 900MHz, 1800MHz and 3.5GHz bands). This, for now, allays fears on how many more players are likely to enter the market. There are also significant doubts as to whether some of those that have been assigned spectrum will actually take off on any significant scale. Instead the occurrence of mergers and acquisitions seems more likely.

Universal Access[4]

The previous licensing regime used two different strategies to improve penetration and access to services: roll-out obligations on the NTOs (later the only other cellular operator during the period – Celtel Uganda was also given roll out obligation for the privilege of operating during the exclusivity), and a rural communication development program (RCDP).

A unit in the UCC administers the fund, although it has its own five-member board

The UCC is mandated by law to establish a rural communication development fund, and did so in February 2003 after conducting a baseline study carried out in 2000 to come up with appropriate policy and strategies. The policy itself was developed in 2001. A unit in the UCC administers the fund, although it has its own five-member board with representation from the UCC board/ Commissioners, the Ministry, consumers and other public members. There have been questions as to whether a more distant working relationship would have been appropriate. However, it is believed that since it is aimed at filling in the gaps not addressed under the commercial operations of the licensees, close cooperation and coordination is necessary for appropriate development of effective strategies to be implemented under the RCDP and licensing regime.

The funding for the RCDP is derived from the 1% levy off gross annual revenue of the operators supplemented by donor support and grants from organisations such as the World Bank as well as other allocations by the UCC. The Fund has recorded total annual receipts of up to US $3million and utilisation of these is around 85%. Although the assumption among many was that the growth in the number of operators would lead to an increase in collections, the increased competition, leading to reduced average revenue per user (ARPU), may counter this assumption.

The 2001 policy had the following as its specific objectives:

- Access to basic communication services to each sub-county with at least 5,000 people
- Ensure limited resources of the Fund are effectively utilised to create immediate impact
- Support establishment of an internet point of presence in every district of Uganda by 2003
- Increase use of ICT in Uganda through at least one vanguard institution in every district
- Promote provision of communications services in rural areas as a profitable business

A number of projects have been implemented to achieve these goals as shown in Table 2 below. Although the program has been widely acclaimed and has fulfilled a number of its objectives as shown in Table 2, the impact assessment of its activities, in the communities in which they have been implemented and towards national development, is not yet known. The UCC has commissioned a study to assess this impact.

[4] *"Rural Communications Development policy for Uganda"*, Uganda Communications Commission, January 2009, www.ucc.co.ug

Table 2: Projects executed under the RCDP (as of August 2009)

Project	Number Implemented
Internet Points of Presence	76
Internet Cafés	99
ICT Training centres	79
Web Portals	78
Public Pay Phones	2,599
Research projects	6
Postal support projects	35
Multipurpose Community Tele-centres	24
School ICT facilities	95
Health ICT facilities	43
Call centres	1
Content development	nil
Charging facilities for Community Information Centres	nil

Source: UCC

The 2005 recommendation on the new telecom policy sets forth a definition of universal access and targets which don't take the traditional approach of focusing on voice alone, but rather on bandwidth connectivity as well. The premise of these is a mission to position ICT as a tool for achieving national government objectives by pillaring activities in the health and education sectors as well as in governance. The RCDP has integrated these targets in its planned activities to compliment the various other strategies, like the licensing regime put in place to achieve the same.

The UCC is in the process of developing a new rural communications development policy

The UCC is also in the process of developing a new rural communications development policy whose focus is on coverage, connectivity and content. The specific objectives and policy actions proposed still embrace the provisions of the 2005 recommendations on the new telecom policy and are based on shared or community access of services.

Telecom, Internet and Broadcasting Market Analysis

Market Segments and Definitions

As a result of the technology neutral licensing regime adopted at the end of exclusivity in 2006, the market is segmented under two broad categories; infrastructure and services.

Public infrastructure provider licence holders are authorised to establish, maintain, operate and provide telecommunication infrastructure to licensed public service providers and private network operators for a period of fifteen years. The public service license on the other hand allows for the provisioning of voice and data services as well as capacity resale services.

It is however worth noting that UTL and MTN continue to operate under their licenses issued in 2000 and 1998 respectively, since the UCC has yet to terminate the existing licence. Zain (formally Celtel) Uganda, whose license expired in 2008, has migrated to the new licensing regime.

In line with the above licensing categories, the regulator has put in place a framework for the assessment of the competitiveness of Uganda's communications sector which includes the definition of markets, the criteria for assessment of competition in each market and remedies where necessary. Ten relevant markets (four retail and six wholesale markets) have been defined for Uganda.

the regulator has put in place a framework for the assessment of the competitiveness of Uganda's communications sector

Table 3: Relevant Telecommunications Markets in Uganda

Retail Markets	
1	Voice services (fixed and mobile)
2	Internet services (retail, broadband and dial-up)
3	Leased line services (retail)
Wholesale Markets	
4	Fixed termination
5	Mobile termination
6	Fixed call origination
7	Mobile call origination
8	Transit
9	International access
10	Transmission links (wholesale leased lines and transmission links (trunk and partial private circuits (PPC))

Source: UCC Competition and Market Assessment Report

Players in the Telecommunications Market

The main providers in the communications sector in Uganda are the 'incumbent' UTL; MTN Uganda operating since 1998; Zain Uganda since 1993; and Warid since February 2008. A number of new entrants have also launched services. Most notable are Orange Uganda which launched in March 2009, i-Tel in September 2009, and Smile Communications Uganda in November 2009.

According to the UCC, a total of 33 licenses under the new licensing regime had been issued to provide infrastructure, services or both by December 2008. Less than half of the licensees have launched operations, while others have exited or are about to exit the market. Table 4 provides a list of telecommunications licenses issued by the UCC by December 2008.

Table 4: List of licensed service providers in Uganda by December 2008

Licence Type	Licensees	Date of Issuance (PIP)	Date of Issuance (PSP)
NTO			
	MTN Uganda Ltd. Uganda Telecom	2000 2000	
PSP and PIP			
	Zain Uganda	September 2008	September 2008
	Warid Telecom Uganda	March 2007	November 2006
	House of Integrated Technology and Systems Uganda Ltd.	March 2007	January 2007
	Infocom	May 2007	March 2007
	Africa Online Uganda Ltd.	July 2007	May 2007
	Afsat Communications Uganda Ltd	August 2007	August 2007
	i-Tel Ltd.	September 2007	January 2007
	Datanet.com LLC	October 2007	October 2007
	Anupam Global Soft (U) Ltd.	November 2007	July 2007
	TMP Uganda Ltd.	November 2007	December 2006
	Nomad Communications Ltd.	April 2008	March 2007
	Sure Telecom	July 2008	July 2008
	Excellentcom Uganda Ltd.	June 2008	June 2008
	Kanyan Telecommunications (U) Ltd.	June 2008	June 2008
	Augere Uganda Ltd.	August 2008	August 2008
	Smile Communications Uganda Ltd.	July 2008	July 2008
	Satellite Communications Networks Ltd.	June 2008	N/A
	Foris Telecom Uganda Ltd.	N/A	N/A
	NR Cyber Business Systems	N/A	N/A
	Clear Stream Uganda Ltd.	August 2008	August 2008
	Latest Technologies International	July 2008	N/A
PSP Voice and Data Only			
	Kampala Siti Cable		January 2007
	Multichoice Uganda Ltd.		April 2007
	Link U Wireless (U) Ltd.		May 2007
	Bukasa Telecom International Ltd.		May 2007
	Kanodiko Systems Ltd.		July 2007
	Radio Communication and Services Ltd.		2007
Capacity Resale + Voice and Data			
	International Telecom Limited		April 2007
PSP Capacity Resale Only			
	Talk Telecom Solutions Ltd.		October 2006
	Roke Investment International Ltd.		October 2006
	Yo Uganda Ltd.		November 2006
	Mo Telecom International Ltd.		January 2007
	Fastcom Limited		November 2007
PIP Only			
	Uganda Electricity Transmission Company Limited (UETCL)	July 2008	N/A

Fixed Line Market

Fixed voice services continue to be provided, mainly by the incumbents MTN and UTL under the NTO license. The current license regime allows any new entrants to provide fixed-line services. Other than Warid and TMP (trading as Broadband Company), who have launched fixed WiMAX services, new entrants have focused on mobile services.

In terms of coverage, fixed-line network is mainly concentrated in Kampala, central and southern Uganda. Both MTN and UTL's fixed-line customer base are predominantly corporate customers.

Market share in the fixed-line market can be assessed in terms of number of subscribers, revenue share, investment and traffic. However, as technologies converge, and since the UCC has not fully required the NTOs to separate accounts based on services or technologies, it is increasingly becoming impossible to conduct separate market analyses for fixed and mobile services. The market shares analysis in this report shall be predominantly based on services (mobile, fixed and SMS combined) and infrastructure.

it is increasingly becoming impossible to conduct separate market analyses for fixed and mobile services

As experienced in similar markets, the total number of fixed-line subscribers in Uganda has remained low. According to the UCC, there were only 168,000 fixed lines by December 2008. This is equivalent to an average of 1 phone per 172 Ugandans. Figure 2 shows the growth in fixed-line services in Uganda from 1996 to December 2008.

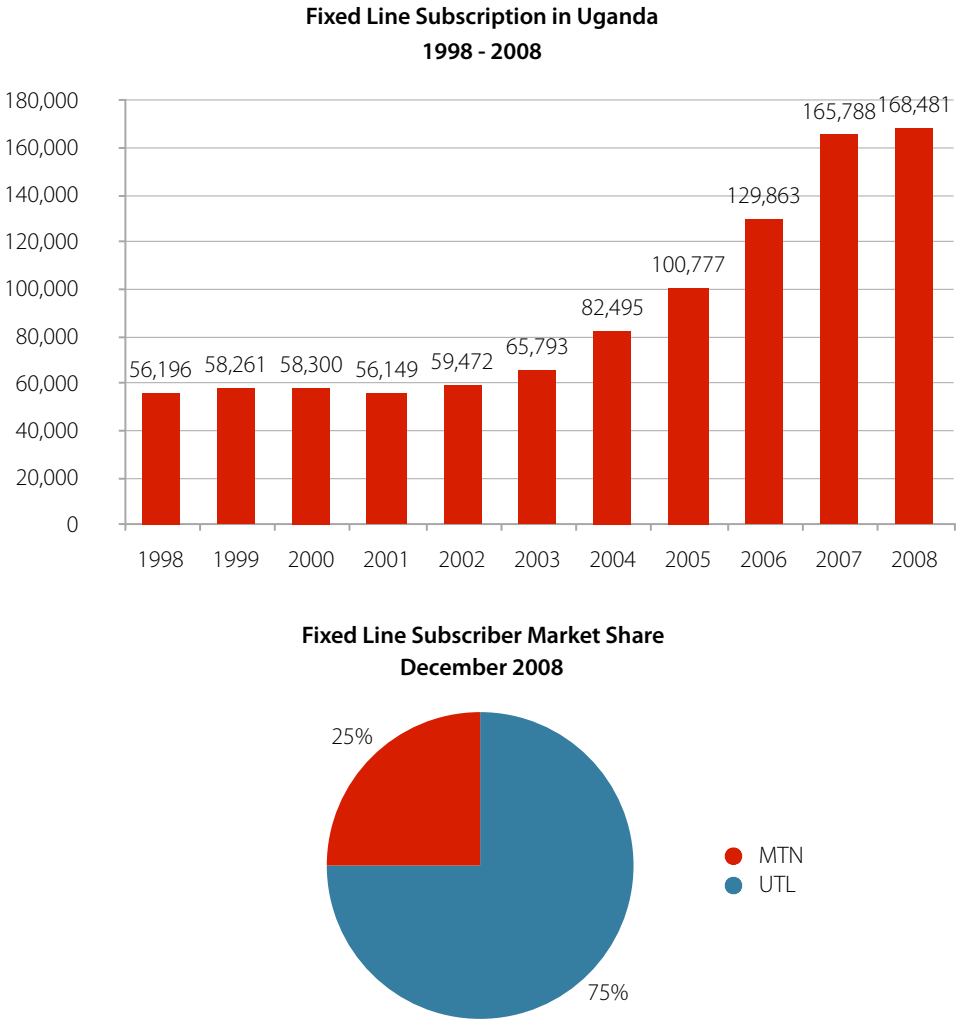


Figure 2: Fixed voice market share

It is also worth noting that payphones, which are included in computing fixed lines, have continued to increase. If taken into account, access to fixed-line services is higher, as many Ugandans use public or private payphones as a means of communication. A survey conducted by the UCC in 2004 showed that 25% of the population use public or private phone services.

Mobile Voice Services

Mobile voice services in Uganda have grown substantially over the past decade. Provided by the three main providers MTN, UTL and Celtel (Zain) until 2005, competition is now increasing with the recent licensing of at least five providers that are likely to enter the mobile voice market, not to mention WARID's Telecom Uganda which launched commercial services in 2008. As a consequence, it is expected that market shares will become more evenly distributed.

Uganda boasts of a geographical coverage and population coverage of 65 and 75 percent respectively for their GSM network

Because of the relatively small size and high population density, Uganda boasts of a geographical coverage and population coverage of 65 and 75 percent respectively for their GSM network (UCC, 2009 Report). Figure 3 below refers.

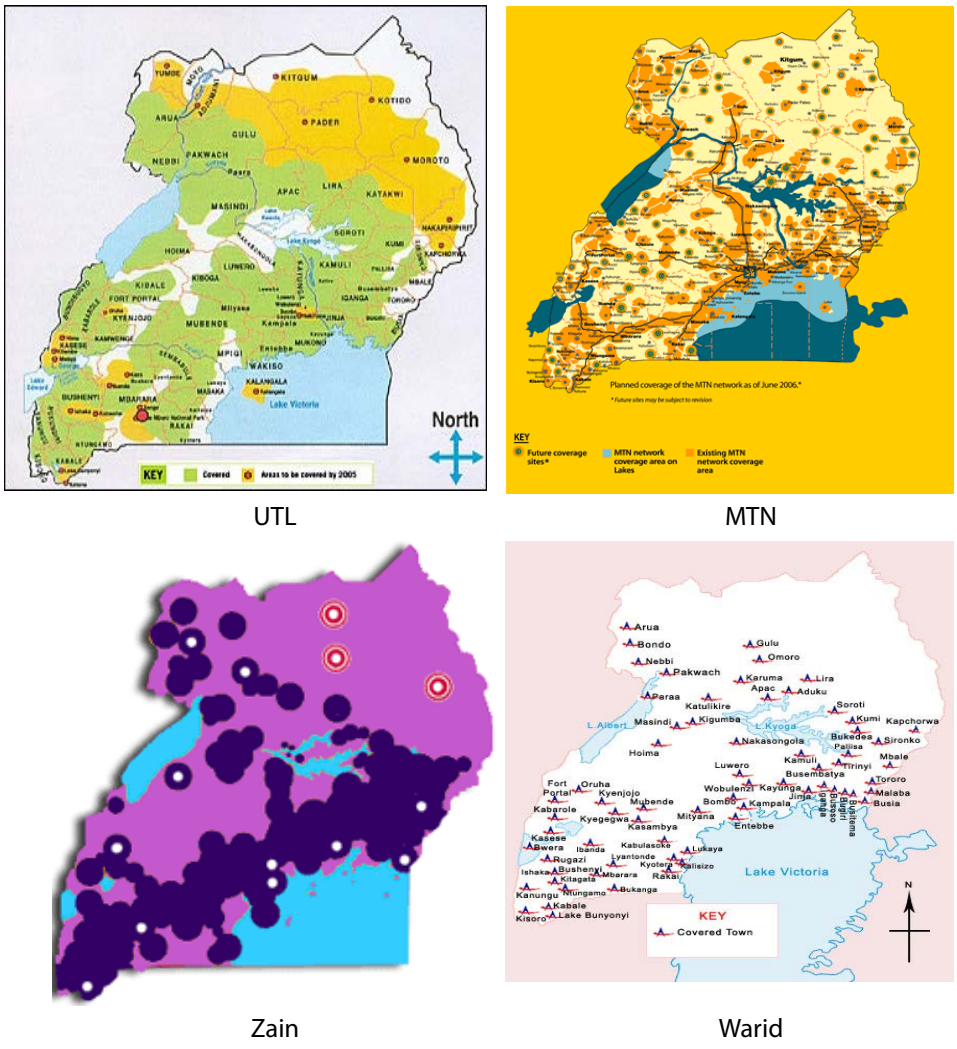


Figure 3: Map of coverage of main service providers (Dec 2008)

Source: Operators' Websites Oct 2008

Due to increased competition, a number of differentiated products have arrived in Uganda's mobile market as providers seek to diversify and target new market segments. Per-second pricing profile, mobile money banking, airtime sharing (M2U) are part of the innovative products on the mobile platform. Operators are using creative promotional offers (which are not always entirely transparent) in an attempt to keep their businesses and to attract new customers. Under basically all operators' current pricing, on-net calls are significantly cheaper than off-net calls – leading many customers to carry multiple SIM-cards or phones.

According to the UCC, there were 8.5 million subscribers by December 2008, compared to 276,000 in 2001

Uganda's mobile subscribers have continued to grow over the past years (see Figure 4 below). According to the UCC, there were 8.5 million subscribers by December 2008, compared to 276,000 in 2001. This would mean that at least one in every four people (28.7% of the population) owns a mobile phone.

This figure might however be skewed due to the existence of multiple SIM ownership. As was pointed out above, a number of consumers hold more than one SIM in order to benefit from the favourable rates for calling within a network. No report or official survey has been conducted to establish the existence of multiple SIM ownership. The high interconnection fees in Uganda make calling between networks expensive.

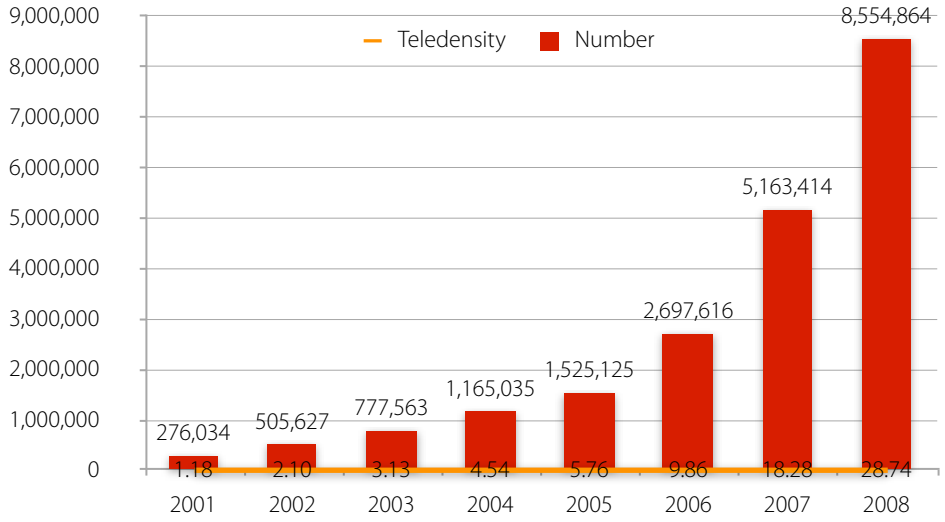


Figure 4: Uganda's Mobile Subscriber Growth 2001-2008

Whereas MTN remained the market leader in terms of subscribers with a market share of 41% by December 2008, their position has declined as competition takes hold in Uganda's market (see Figure 5 below).

Zain Uganda was the worst hit, losing close to 10% of its share from 35% to 25% between January and December 2008. The rebranding from Celtel to Zain Uganda coincided with the entry of new service providers such as Warid, which probably disrupted Zain's progress as some consumers confused them for new entrants and therefore perceiving them as less attractive.

Zain Uganda was the worst hit, losing close to 10% of its share between January and December 2008.

Uganda telecom market share increased from 20% to 23%, while Warid, in less than a year of commercial presence, managed to gain market share of 11%, an impressive achievement. Warid today has become the number one choice for a second SIM card due to their low pricing entry strategy and on-net promotions.

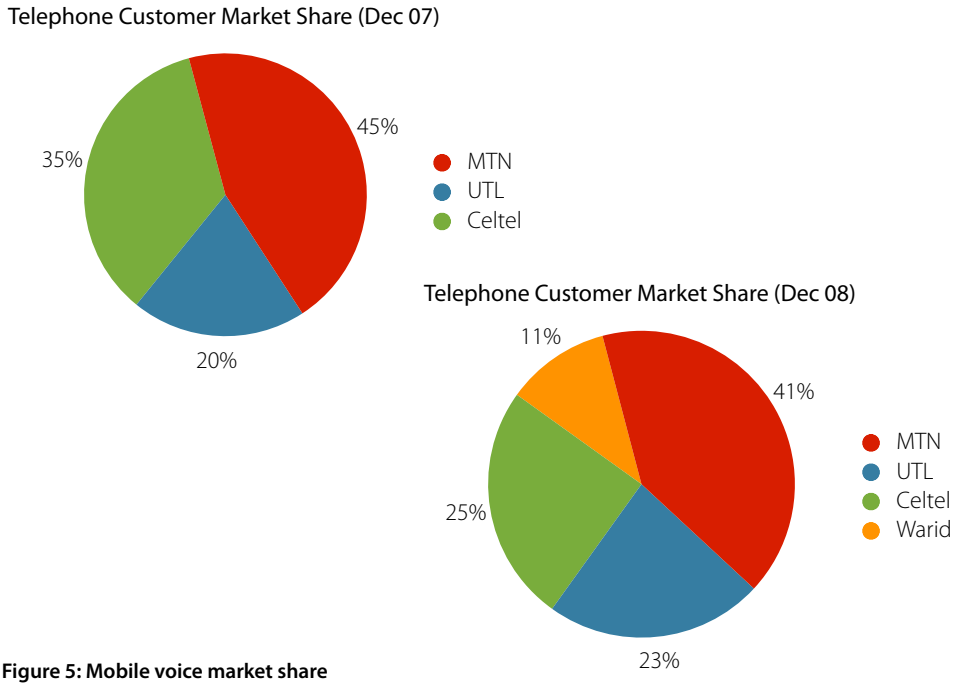


Figure 5: Mobile voice market share

Source: UCC Market Analysis report 2008

Traffic

The traffic analysis in this section takes into account minutes of use for both fixed and mobile services. Data available (including that from the UCC) does not provide a break down between technologies.

The effect of increased liberalisation, promotional campaigns and price cutting is reflected in the patterns of traffic for Uganda's market.

The effect of increased liberalisation, promotional campaigns and price cutting is reflected in the patterns of traffic for Uganda's market. Large gains were recorded for on-net traffic, which more than doubled during the period (see Figure 6 below).

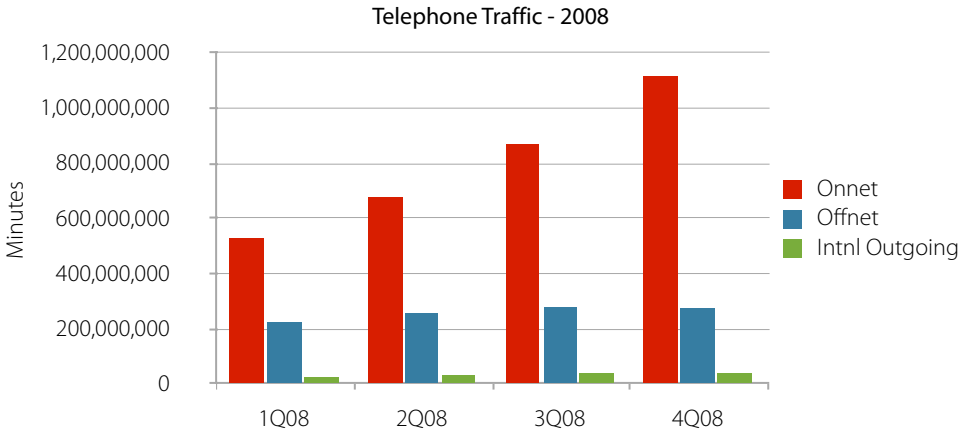
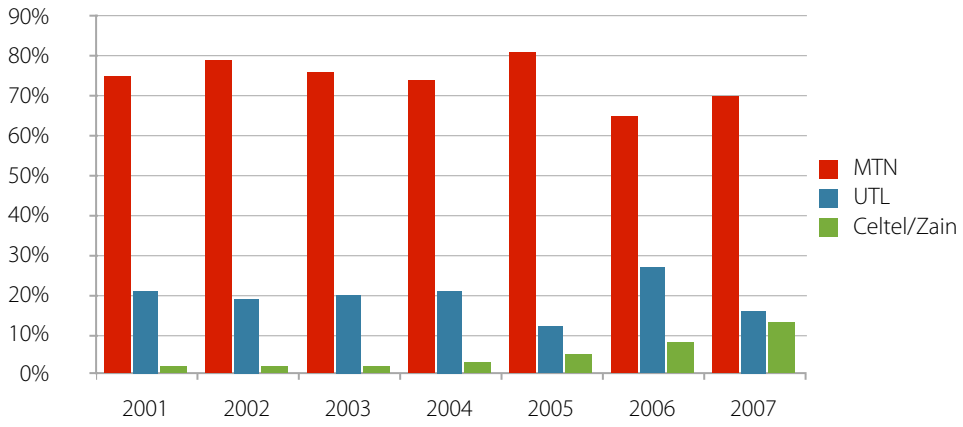


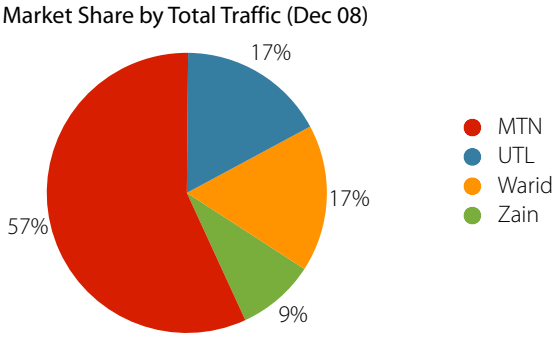
Figure 6: Voice traffic in 2008

Source; UCC market report December 2008

Market share in terms of volume indicates that prior to 2008 most traffic originated and terminated in MTN's network, as shown below. This situation appears to be changing though. For the year ending December 2008, MTN's market share by traffic had been reduced to 57%, which is still very significant compared to MTN's nearest rival, Uganda telecom, at 17% (fixed and mobile volumes) and Zain at 9%. Warid's market share in terms of minutes of use was significant at 17%, thanks to their on-net tariff plans that offer free on-net calls.



Source; UCC Market Analysis Report produced by PWC



Source: UCC Competition Report prepared by PWC-UK

Figure 7: Mobile traffic distribution between MTN, Zain and UTL, 2001-2007

SMS

Short Messaging, just as was the case in developed markets a couple of years ago, is beginning to catch on in developing economies like Uganda. Close to 190 million short messages were generated during the 4th quarter of 2008, which represented a growth of 65% from the previous quarter. Other value-added services such as SMS banking, SMS marketing, and bulk SMS are contributing to the growth of this market.

Close to 190 million short messages were generated during the 4th quarter of 2008

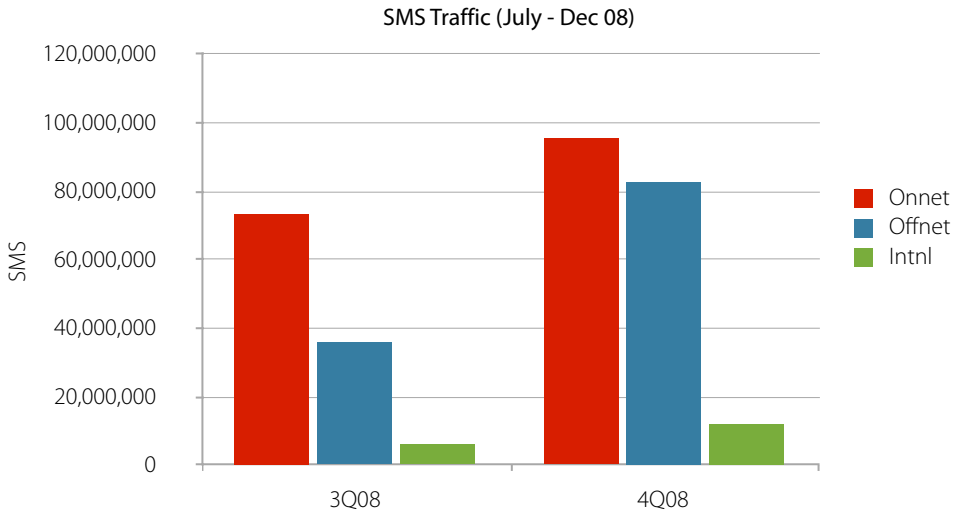


Figure 8: SMS traffic in the last half of 2008

Source: UCC Market Review December 2008

Internet Market

Internet services are a nascent market in Uganda. Internet services in Uganda are provided via the following technologies:

- Dial-up narrowband internet services;
- Digital Subscriber Lines (ADSL) mainly used by UTL, offering speeds between 64 kbps and 256 kbps;
- Private VSAT satellite wide area network as provided by AfSat;
- WiMAX as rolled out by MTN in 2007; and
- Mobile services via 3G (offered by UTL), GPRS, and EDGE offered by other mobile operators.

Despite being landlocked, it is hoped that Uganda will benefit from one of the ongoing regional initiatives to connect the East African region to the rest of the world in 2009 or 2010 via submarine cables, including the Kenyan-led TEAMS, SEACOM, The East African Marine System and the East African Submarine System (EASSy).

In the absence of fibre-optic cable connections to the World Wide Web, providers have relied on their own earth stations and satellite links for international voice and data traffic, including Internet traffic. Typically, operators and ISPs have their own earth stations, rather than using shared gateways. This is due to the high prices offered by the main telecommunications operators.

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Satellite capacity is relatively expensive, costing around 1,500 USD/Mbps/month in each direction. A concern has been expressed by ISPs and entrants that even in the event that the fibre optic cable becomes available, access might be restricted by the new fibre owners.

This is not expected to occur before the completion of the EASSy cable in 2010 (if fair access is provided) – unless the government initiates and finances a short-term solution through one or more additional high speed satellite links (e.g. through use of the RCDF for this purpose).

Figure 9 shows that there was growth in usage of international bandwidth between 2002 and 2008, but usage is still limited. In March 2008, UCC estimated that uplink bandwidth was at 92 Mbps and downlink bandwidth at 291 Mbps (excluding local traffic exchanged via the Uganda Internet Exchange Point [UIXP]).

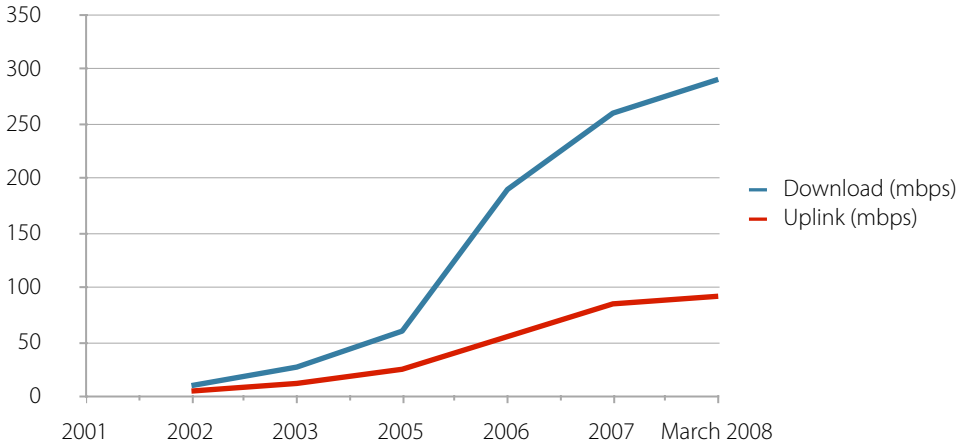

Figure 9: Development of international bandwidth usage (2002–2008)

Source: Uganda Communications Commission

Market shares for retail Internet services can be constructed in various ways, particularly:

- Number of subscribers currently taking internet services
- Revenue
- Data volumes

The total number of fixed-line Internet subscribers in Uganda was only 22,000. Market share by fixed subscribers at Q3 2008 is shown in the figure below.

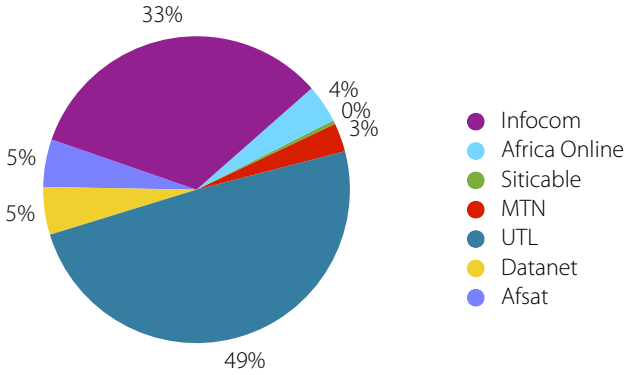

Figure 10: Market share fixed Internet subscribers Q3 08

Source: UCC

The preference for mobile Internet is due to its easy access, mobility and availability.

This market share analysis does not, however, capture mobile Internet subscribers. This market segment is following a similar trend to the mobile voice market. The preference for mobile Internet is due to its easy access, mobility and availability. MTN had the largest market share at 68%, followed by Uganda telecom.

Market shares for mobile-only internet subscribers are shown below.

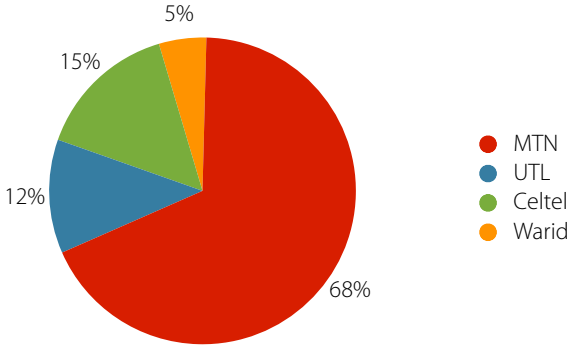

Figure 11: Market share mobile Internet subscribers Q3 08

Source: UCC

Combined fixed and mobile market shares by revenue are shown in the figure below.

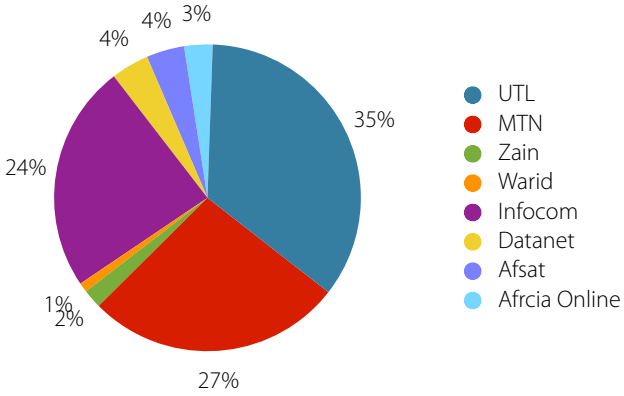

Figure 12: Market share fixed and mobile internet revenues - Q308

Network Development /Infrastructure[5]

Fixed Lines

The expanse of the GSM networks means fixed telephony services can be provided in a vast number of locations around the country.

Fixed-line telephony in Uganda is today mainly provided over wireless access networks especially in the case of individual customers. Technologies used are mainly CDMA and GSM, with WiMAX now starting to emerge. The expanse of the GSM networks means fixed telephony services can be provided in a vast number of locations around the country.

There are remnants of the copper access networks mainly in the capital, Kampala, and of optical fibre connections mainly in the corporate market segment. The optical fibre rings have greatly improved the quality of the services.

All switches in the Public Switched Telephone Network (PSTN) are digitalised.

Despite the slow uptake of fixed telephony services beyond corporate customers, the number of fixed telephony services has grown to 210,655 subscribers (as at March 2009). However, it would seem a number of new entrants do still view the fixed telephony market as lucrative, and have plans to deploy using IP and wireless technologies.

Mobile

Mobile services are available today using GSM in the 900MHz and 1800MHz band. However, two of the operators have also rolled out UMTS services in limited parts of the country, and others have indicated plans to provide CDMA EV-DO and mobile services over WiMAX.

2361 base stations have been erected around the country, with the highest concentration in the capital. The GSM coverage today extends to all districts but in some instances the rural areas remote from the towns have scanty or no network signal. Present geographical coverage is estimated at about 65% coverage. A more up-to-date audit is required to ascertain the actual level of coverage.

The number of subscribers has grown significantly to 9,801,173, although this figure is skewed due to persons holding up to four SIM cards each. There continues to be interest in investing in the market in terms of more entrance into the market.

Broadband

Competition in the Internet market has also increased due to the participation of voice operators in the market segment and the offer of bundled services. This is especially common in the provision of services to corporate clients, mainly over optical fibre.

There are WiMAX and WiFi offerings, 3G access in some towns and cities as well as GPRS connections on the GSM networks.

There is increasingly a shift in the means of access to Internet services, with the strong emergence of mobile and wireless as opposed to traditional fixed access. There are WiMAX and WiFi offerings, 3G access in some towns and cities as well as GPRS connections on the GSM networks. Blackberry services are also currently available from three of the operators (UTL, MTN and Celtel). However, up-country, especially in the rural areas, VSATs are commonly deployed, particularly in providing services to remote NGOs.

UCC also increased access by having Internet points of presence established in all the district headquarters. Services are available via these through STM 4 and E1.

Use of leased-line facilities is still prevalent, although the availability of infrastructure is the limitation.

Backbone

The transmission network today consists of mainly microwave links. UTL's core network consists of fibre optic across the south of the country as well as microwave in the remaining areas, while that of MTN includes fibre-optic cable in the south with added links north of Kampala. In addition to this, the fibre network of Uganda Electricity Transmission Company Limited is now commercially available to the market, and more recently the national fibre backbone (phase 1)

[5] "*Market review December 2008*", www.ucc.co.ug

was completed (but is yet to be commercialised due to a need to sort out management of the fibre in terms of the commercial operations).

There are optical-fibre links connecting the capital Kampala to Entebbe and Jinja, which are the major centres of economic activity, all the way to the Kenya border in the east, with further expansions currently underway to link to Masaka and Mbarara in the west. UTL and MTN are working jointly on a project to connect Uganda to the East African Backhaul System (EABS), a terrestrial cable link which will link Tanzania, Burundi, Rwanda, Uganda and Kenya to submarine cable. In April 2008, UTL started work on a fibre-optic link connecting the west Ugandan town of Mbarara to the Rwandan boarder border crossing point at Katuna.

Within Kampala, optic-fibre rings have been installed in the Central Business District (CBD). The fibre in place is estimated to total over 2500km, inclusive of government and privately owned fibre.

The national and regional transmission links are to a great extent digital. However, one of the major drivers of growth of the optical fibre network has been the arrival of the undersea cables to the East African coast. With Seacom having arrived in Mombasa Kenya, TEAMS expected soon and EASSy indicated to follow thereafter, there is a desire to tap in to this to replace the current dependency on satellite for international access out of Uganda.

one of the major drivers of growth of the optical fibre network has been the arrival of the undersea cables to the East African coast

Broadcasting

As of 31st July 2009, there were nine free-to-air TV channels in the capital. Fifty-four analogue TV broadcast licences had also been issued, although of these, thirty-seven stations were operational. The UCC is also preparing to conduct digital TV broadcasting.

In the case of subscription TV, after the closing of GTV, DSTV remains the only subscription TV provider. There is also only one MMDS provider. However, free to air satellite channels are not regulated by the UCC under the provision of Cap 106 Laws of Uganda that exempt equipment capable only of reception of broadcasts from requiring a licence. The UCC does not licence cable providers either.

Human Capital[6]

The National ICT policy has as one of its objectives improving literacy and building human resource capacity.

The National ICT policy has as one of its objectives improving literacy and building human resource capacity. A number of strategies were set out to achieve the following:

- Integrate ICT in mainstream educational curricula as well as other literacy programmes and provide for equitable access by pupils and/or students at all levels.
- Develop and manage ICT Centres of Excellence to provide basic and advanced ICT training.
- Set up mechanisms that promote collaboration between industry and training institutions so as to build appropriate human resources capacity.
- Promote twinning of training institutions in Uganda with those elsewhere so as to enhance skills transfer.
- Promote appropriate incentives to public and private sector partners in order to ensure contribution to skills development in the ICT sector.
- Design and develop incentives aimed at attracting foreign-based Ugandan ICT professionals to the country.
- Establish training schemes as well as training manuals for development information providers and for workers at district and sub-county levels responsible for its onward transmission.
- Provide technical assistance and training for communication experts in the maintenance of equipment as well as in media economics and social sustainability.
- Develop, in collaboration with professional bodies, business and other organizations, standard curricula in all institutions engaged in training communication and ICT specialists of all categories.
- Put in place mechanisms that will improve ICT skills among employees of the public sector.

the 2005 recommendation for the new telecom policy had as one of its objectives increasing the levels of ICT functional literacy in all sectors

Although the coordination framework proposed for the implementation of this policy was never established, the provisions of the policy have been picked up by respective sectors, in particular the ministries. In this vein, the 2005 recommendation for the new telecom policy had as one of its objectives increasing the levels of ICT functional literacy in all sectors and building human resource capacity to support the sector. The strategies identified to achieve this were to:

- Create the opportunity and potential for the youth to be the drivers of ICT in Uganda through the early integration of ICT in the curricula of education system at all levels and support for the establishment of Vanguard educational institutions.
- Participate as appropriate in the development and implementation of a coordinated policy and strategy for ICT in the education sector.
- Encourage and promote the use of low cost ICT technologies such as WiFi and VoIP for educational institutes.
- Develop a low-cost rate policy for educational institutions. (E-Rate model for schools).
- Accord due regard to intellectual assets through the establishment of the necessary policies and laws that attach value and reward to intellectual assets.
- Encourage and support research and development in ICT through local universities and research institutions and publicise and disseminate information with a view to encouraging greater participation.

As with many of the other components or provisions of the recommendation, the UCC has picked up on a number of these, integrating them into programs such as the RCDP.

The education ministry also developed an ICT program whose mission is given as providing equitable access to quality education and timely accurate information using ICT[7]. Accordingly, the policy set was:

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[6] National Information and Communication Policy, Ministry of Works, Housing and Communications, October 2003
[7] Draft policy for Information and Communications Technology in the Education Sector, July 2005

- To encourage primary schools that have ICT equipment to use the technology to support teaching, either by producing teaching materials or by use of the technology with students. In addition, to introduce computer awareness into the training of primary teachers on a phased basis, so that newly qualified teachers are equipped to make use of ICT as it becomes available.
- At secondary level, to equip secondary teachers to make use of ICT in their lesson preparation, and to use ICT in their teaching where the equipment is available. In addition, a specific subject based on ICT applications to be provided for schools that have sufficient equipment.
- At the tertiary level, to encourage the provision of ICT skills in all higher education courses, so that as far as possible, all those leaving their level have basic computer skills.

The main challenges to the achievement of these goals remain the lack of equipment in schools, lack of electricity, mainly in the rural areas, the lack of sufficient ICT infrastructure in a number of areas and the currently high cost of internet access.

Despite these challenges, there have been great achievements in terms of the introduction of ICT in schools, supported at higher levels of learning by the development of numerous training programs in the area of ICT (ranging from certificate course to post graduate courses) offered by different types of institutions in the country.

there have been great achievements in terms of the introduction of ICT in schools

The UCC has as some of its functions under the Act[8]:

- To collaborate with educational institutions in order to promote specialized education in the field of communications; and
- To establish, manage and operate a communications services training centre.

To this end, it has actively lent support to training programs, especially in tertiary institutions in the areas of research and development. It also developed one of the ICT training institutes, namely the Uganda Institute for ICT (UICT), which offers courses to the public that are recognised in the sector.

Within the regulator, the UCC has for years had a policy of maintaining a lean, highly skilled and highly motivated staff. As a result, the UCC invests heavily in training of its staff but is still constrained by the cost of training required to keep on par with the operators.

[8] Cap 106 Laws of Uganda

E and M Applications

The government of Uganda, through the Ministry of ICT, has implemented and continues to extend the National Data Transmission Backbone Infrastructure and e-Government Infrastructure (NBI/EGI) project. Ultimately, the backbone will link Uganda to the submarine cables on the East African coast. The project has two key components, namely the National Backbone Infrastructure (NBI) and the e-Government Infrastructure (EGI), to be implemented in three Phases at a total contract cost of $106m. Phase I was for e-Government Infrastructure and its objective was to provide connectivity to government ministries and departments, including high-tech communication services, called TETRA, for the Uganda Police, with a total cost of $30 million. This component was designed for internal government use, commonly referred to as Government-to-Government services, and not for general public usage. Since the phase was to connect ministries, only Kampala, Entebbe, Jinja and Bombo were connected, with a total distance of 168km of laid fibre and related equipment. Phases II and III of the NBI constitute the remaining areas of the country including establishing a high-tech government data centre. The NBI/EGI project is at the nexus of preparing the country for full participation in the new Information Age.

The mobile phone based information service is expected to greatly ease the day-to-day life of the rural population

One of the leading NTOs – MTN Uganda – in partnership with Grameen Foundation and Google Search, launched a suite of mobile phone applications which will provide instantly information that was previously unavailable to Uganda's poor and remote communities. The suite of five mobile services combines text messaging, search technologies and databases of locally relevant information. It provides weather forecasts, agricultural advice and health tips, while a "Clinic Finder" application can locate nearby facilities. Also included is "Google Trader", a virtual marketplace that links buyers and sellers to trade anything from agricultural produce to jobs. For example, through a simple text message a villager can receive tips on treating crop diseases, learn local market prices, or get advice on preventing malaria. The mobile phone based information service is expected to greatly ease the day-to-day life of the rural population, helping them to easily access vital data and advice on issues ranging from business, agriculture, and health, to the environment, weather etc., thus extending their knowledge and providing an opportunity to improve their social welfare. The introduction of the service was the culmination of an 18-month-long field-based programme in Uganda and an innovative partnership that strategically combines the resources of MTN, Grameen Foundation and Google. The five mobile phone applications provide real-time information in three domains: agriculture, health, and a virtual marketplace for buying and selling goods and services. The applications were developed by Grameen Foundation's Application Laboratory (AppLab) and are powered by MTN on the Google SMS search platform (Source: mtn.co.ug).

Telecommunication and Regulation Environment Perception

As part of the telecommunications Sector Performance Review for 2009, we undertook a regulatory environment assessment. Our evaluation of the telecommunications regulatory environment draws on the methodology developed by Samarajiva et al[9], which samples the perceptions of stakeholders involved with the telecommunications sector in order to provide insight into the current status of the regulatory environment.

Table 5.
Dimensions used in survey evaluating the perceptions of telecoms regulatory environment in Uganda

Dimension	Aspects Covered
Market Entry	Transparency of licensing. Applicants should know the terms, conditions, criteria and length of time needed to reach a decision on their application. License conditions. Exclusivity issues.
Scarce Resources	Timely, transparent and non-discriminatory access to spectrum allocation. Numbering and rights of way: frequency allocation, telephone number allocation, tower location rights.
Interconnection	Interconnection with a major operator should be ensured at any technically feasible point in the network. Quality of interconnection comparable to similar services offered by own network. Reasonable rates for interconnection. Unbundling of interconnection. Interconnection offered without delay. Sharing of incoming and outgoing IDD revenue. Payment for cost of interconnection links and switch interface. Payment for cost of technical disruption of interconnection.
Tariff Regulation	Regulation of tariffs charged from consumers.
Regulation of Anti-Competitive Practices	Anti-competitive cross subsidisation. Using information obtained from competitors with anti-competitive results. Not making technical information about essential facilities and commercially relevant information available to competitors on a timely basis. Excessive prices. Price discrimination and predatory low pricing. Refusal to deal with operators and other parties. Vertical restraints. Technical disruption of interconnection. Sharing of towers and facilities by parent company and subsidiaries in different segments of the market.
Universal Service Obligation (USO)	Administration of the universal service programme/fund in a transparent, non-discriminatory and competitively neutral manner and is not more burdensome than necessary for the kind of universal service defined by the policymakers.
Quality of Service (QoS)	The actual performance of a service with respect to what is promised, depending upon the network traffic control mechanisms. Specific criteria may be call quality (for mobile and fixed), connection speeds or throughput (for broadband)

We identified the various stakeholders within the sector, who included people from academia, the private sector, the media, government agencies, telecom operators, etc. Potential respondents were directed to an online survey as a way to quickly collect and analyse the data. Out of all the solicitations sent out by email, we received back 46 responses. Of these 41 were complete, while five completed only the portion for fixed sector.

We identified the various stakeholders within the sector, who included people from academia, the private sector, the media, government agencies, telecom operators, etc.

[9] SAMARAJIVA, R., DOKENIYA, A., FERNANDO, S., MANIKKALINGAM, S. & SANDERATNE1, A. (Eds.) (2005) Regulation and Investment: Sri Lanka Case, World Dialogue on Regulation for Network Economies.

The perception for each dimension was judged based on a Likert-scale:

- Highly Ineffective (1 point)
- Ineffective (2 points)
- Neutral (3 points)
- Effective (4 points)
- Highly Effective (5 points)

The following table summarizes the responses to the perception survey of the telecommunications regulatory environment in Uganda. More detail is provided in the dimension-specific discussions that follow.

Table 6. Dimensions used in evaluating the telecoms regulatory environment in Uganda

Dimension	Average Response
Market Entry	Neutral (3.0)
Access to Scarce Resources	Ineffective (2.5)
Interconnection	Ineffective (2.7)
Tariff Regulation	Ineffective (2.7)
Regulation of Anti-Competitive Practices	Ineffective (2.7)
Universal Services Obligation (USO)	Ineffective (2.9)
Quality of Services (QoS)	Ineffective (2.7)

Market Entry

The average TRE perception for market entry is neutral (3.0). On the whole, the mobile sector is perceived more favourably, with 43.2% of the responses indicating it is effective or highly effective compared to 27.3% for fixed and 24.2% for broadband.

Access to Scarce Resources

The average TRE perception for access of resources is Ineffective (2.5). While the Ugandan regulator has performed well in this area in the past, there seems to be a change in perception. Part of the explanation for the change could be attributed to the change in the regulatory regime and to the fact that the regulator now allocates more resources besides spectrum.

spectrum allocation affects both market entry and access to scarce resources

As alluded to in section 2.4, spectrum allocation affects both market entry and access to scarce resources. This arises from both over-allocations at the onset of licensing, when the market was opening up, as well as non-utilisation of allocated spectrum by some licensed entities. The UCC has plans for spectrum re-farming, but these are not discussed openly in the public domain. One area in which the UCC is becoming more aggressive is in the pursuit of licensees who have not yet operationalised the services for which they obtained a license from the UCC.

Interconnection

The average TRE perception of the interconnection regime amongst telecom operators is Ineffective. 50.4% of the participants rated the dimension either ineffective or highly ineffective compared to 15.9% who perceived it as effective or highly effective.

Following the Interconnection Cost Study project, the UCC has recognised the limitations of the ex-post regulatory approach to interconnection as competition in the market heats up. Established operators are using interconnection fees to create an entry barrier by charging new operators higher fees to connect with their existing customer bases. Their first approach to derive interconnection rates based on incremental cost modelling were blocked by a court injunction instituted by MTN, who asserted that the UCC did not have the legal mandate to set interconnection rates. The case was later withdrawn by MTN and the two parties agreed to solve

the matter amicably out of court. The UCC's latest approach is to sit down with operators and agree on a new interconnection rate. Decisions emanating from these discussions have not yet been formally made public[10].

Tariff Regulation

The average TRE perception of regulator independence is neutral. 65% of the participants rated the independence of the regulator as neutral or satisfactory. They agree that the regulator's independence does exist legally and is generally practiced in their operations. Having assets that generate income and provide financial independence from Government is positive, but some respondents were unhappy with the regulator's ability to guide government policy. An example a few cited was the increasing taxes for communication services, which are ultimately borne by the consumer. The regulator is on record as having advised government against increasing taxes on telecom services, but theirs is only an advisory role as far as government policy is concerned.

The UCC has the mandate to regulate tariffs and does this though price-cap formulae. Operators are also required to submit annual price-cap tariffs that are cost-based, on the basis of which they then charge consumers. While the final tariffs are approved by the UCC, all the prior information is held in private, making it difficult to judge the performance of both the operator as well as the UCC in regulating tariffs. Some of the reasons that might explain the poor perception may arise from the different costs charged by different operators to call outside their network, as well as the multitude of tariff-options that are offered by each operator.

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Universal Service Obligations (USOs)

While coverage for various telecommunications services across the country has greatly improved over the years, access in many rural areas is still a challenge. The regulator is credited with running one of the most vibrant USO funds, which has accomplished many of its objectives in the last planning period, but there is not much research that has been done about the actual impact of the projects that it has completed. Besides market entry, USO is the second highest rated dimension in terms of performance. 45.3% perceive progress towards universal service as ineffective or highly ineffective, 36.8% perceive progress as neutral, while 17.9% perceive it as effective or highly effective. The average TRE perception for universal services is ineffective (2.9).

Quality of Services (QoS)

The average perception of participants regarding progress towards regulation of quality of service for various services was Ineffective (2.7).

Although different types of licenses have a component for QoS, and the UCC regularly monitors their conformance, not much factual information is known about QoS performance in the public domain. It is only recently that the UCC has started to publish some QoS information under its "name and shame" policy. They started off by publishing an advert in the newspapers that indicated the number of different types of consumer complaints that they have received about the different telecommunications service providers.

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[10] http://www.monitor.co.ug/News/National/-/688334/923586/-/x064gm/-/index.html

Conclusion

The increased competition resulting from the entry of a number of service providers in a generally 'small' market has given users a stronger bargaining position

Despite the absence of a new sector policy, the communications act enacted in 1997 is still relevant (with a few limitations), and has propelled the effective regulation of the sector. Because of advances in technology service provision, the regulator has adopted a technology neutral licensing regime. However, it is still challenged with issues of interconnection and uncompetitive practices, largely driven by the incumbents. The increased competition resulting from the entry of a number of service providers in a generally 'small' market has given users a stronger bargaining position. It is however noteworthy that while a number of licenses have been issued, a number of the licensees have yet to start operations. The Universal Access initiative has made tremendous progress, realizing most of its set objectives. What is pending is the assessment of its impact of the rural communities that it targeted. Mobile voice services have continued to grow, as evidenced by subscriber and traffic patterns. GSM coverage is countrywide, though coverage in some rural areas is limited. However, the market share of the incumbents has been reduced, resulting from the competition from the new entrants. Growth in SMS services has similarly taken an upward trend, spurred by value-added services like mobile money. The Internet market continues to grow, with mobile Internet proving a popular means of access in the capital. VSAT access still predominates in the rural areas. E&E applications are still in the nascent stages, largely driven by the private sector. While the backbone infrastructure is still largely microwave, the various initiatives of government and the private sector in growing the optical-fiber backbone will go a long way in enhancing the various services, particularly for regions remote from the capital.

A concern, however, is the perception of the community, which is in direct contrast to the seemingly great progress in the service provision sector. In general, the perception by most respondents was negative, with many viewing the regulator as ineffective for all categories of services. There is possibly a need to reconcile the service provision and service demand measures of this study to clearly understand this discrepancy, and possibly amend the gap or misalignment between the two.

In order for Uganda to reap the full benefits of full liberalisation, it is important that the right environment is in place to facilitate investment and foster competition. This involves a consideration of the following:

- Improving the availability and capacity of cost effective quality infrastructure with reasonably priced international access;
- Putting in place and implementing (enforcing) appropriate competition safeguards;
- Reviewing the regulatory approach to ensure only the right bits are regulated and the right amount of regulation is applied;
- Making available a quality labour pool adaptable to changes in technology;
- Reviewing and ensuring that taxes in place or proposed are not inhibitors to growth and development of the sector; and
- Maintaining political, economic and social stability as advantageous in attracting and retaining investment within the sector.

Evidently there is great need for public-private partnering to realise the desired objectives.

References

- The Interconnection Cost Study project www.ucc.co.ug
- *"Rural Communications Development policy for Uganda",* Uganda Communications Commission, January 2009, www.ucc.co.ug
- *"Market Review December 2008"*, www.ucc.co.ug
- National Information and Communication Policy, Ministry of Works, Housing and Communications, October 2003
- Draft policy for Information and Communications Technology in the Education Sector, July 2005
- Cap 106 Laws of Uganda, www.ucc.co.ug
- SAMARAJIVA, R., DOKENIYA, A., FERNANDO, S., MANIKKALINGAM, S. & SANDERATNE1, A. (Eds.) (2005) Regulation and Investment: Sri Lanka Case, World Dialogue on Regulation for Network Economies.
- http://www.monitor.co.ug/News/National/-/688334/923586/-/x064gm/-/index.html
- http://www.monitor.co.ug/Business/Business%20Power/-/688616/915798/-/ljc8dp/-/index.html

List of Abbreviations

ADSL	Asymmetric Digital Subscriber Line
ARPU	Average Revenue Per User
CDMA	Code Division Multiple Access
EASSy	East African Submarine System
EV-DO	Evolution-Data Optimised
GDP	Gross Domestic Product
GSM	Global System for Mobile Communication
ICT	Information Communication Technology
IP	Internet Protocol
ISP	Internet Service Provider
LTE	Long Term Evolution
MMDS	Multichannel Multipoint Distribution Services
NGO	Non Governmental Organisations
NTO	National Telecommunications Operators
PC	Personal Computer
PSTN	Public Switched Telephone Network
RCDP	Rural Communications Development Program
SIM	Subscriber Identity Module
SMS	Short Messaging Service
UCC	Uganda Communications Commission
UMTS	Universal Mobile Telecommunications Systems
UTL	Uganda Telecom Limited
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminals
WiFi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access

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