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The Changing International Telecommunications Environment: Country Case Studies

UGANDA

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This Final Report is presented to the Commonwealth Telecommunications Organisation (“CTO”), the World Bank *InfoDev*, and the International Telecommunication Union by Clifford Chance and Booz.Allen & Hamilton on 4 February 1998.

The information contained in this Final Report has been obtained from meetings with and information provided by Uganda Posts and Telecommunications Corporation, the Ministry of Works, Transport and Communications and the Privatisation Unit of the Ministry of Finance.

**Clifford Chance
Booz.Allen & Hamilton
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1. GENERAL SOCIO-ECONOMIC SITUATION OF UGANDA

This section provides a general overview of the socio-economic situation in Uganda.

1.1 Background

The Republic of Uganda is a landlocked country in East Africa covering an area of 235,885 km² (94,354 miles²). Major metropolitan areas include the capital city of Kampala and the cities of Jinja, Mbale, and Mbarara. The country's terrain consists of 18% inland water and swamp; 12% national parks, forest, and game reserves; 70% forest, woodland, and grassland. The climate in the northeast is semi-arid, with annual rainfall of less than 50 cm (20 in.), while in the southwest annual rainfall is 130 cm (50 in.) or more.

1.2 Socio-Economic Indicators

The table below gives some of the major economic indicators for Uganda for the years indicated:

Table 1.1: Macro-economic statistics

Factor	1990	1991	1992	1993	1994	1995	1996
GDP, real (US\$m)	7,677	8,093	8,355	9,053	9,602	10,675	11,683
GDP, nominal (US\$)	4,304	3,321	2,856	3,220	3,981	5,655	6,005
GNP, real per capita (US\$)	454	464	465	488	502	545	585
GDP growth	6.4%	5.4%	3.2%	8.3%	6.1%	11.2%	9.4%
GNP per capita (US\$)	350	260	200	190	190	240	290
Disposable income per capita							
Total consumption per capita (US\$)	262	195	163	177	205	273	285
Inflation (%)		27.7	54.5	5.1	10.0	6.6	
Population (Mil)	16.92	17.44	17.97	18.56	19.12	19.57	19.98
Population growth rate (%)	3.2	3.1	3.0	3.3	3.0	2.4	2.1
Balance of trade capital (US\$m)							
Exchange rate Shillings to US\$	428.9	734.0	1,133.8	1,195.0	979.4	968.9	1,046.1
CPI (1987=100)	636.4	815.0	1,242.4	1,317.9	1,446.2	1,569.9	1,684.6

Source: Case Study

Costs in the telecommunications sector have been estimated by Uganda Posts and Telecommunications Corporation ("UPTC") to have inflated by only 6% in the period from 1992 to 1996.

1.3 Economic Driving Forces

Uganda's economy has great potential. Endowed with significant natural resources, including amply fertile land, regular rainfall, and mineral deposits, it appeared poised for rapid economic growth and development at independence. However, chronic political instability and erratic economic management produced a record of persistent economic decline that has left Uganda among the world's poorest and least-developed countries.

Agricultural products supply nearly all of Uganda's foreign exchange earnings, with coffee alone accounting for over 90% of the country's exports. However, with world coffee prices unreliably fluctuating and coffee wilt disease damaging production, other exports are becoming more important. Exports of hides, skins, vegetables, fruits, flowers, and fish are growing, and cotton, tea, and tobacco continue to be mainstays.

Most industry is related to agriculture. The industrial sector is being rehabilitated to resume production of building and construction materials, such as cement, reinforcing rods, corrugated roofing sheets, and paint. Domestically produced consumer goods include plastics, soap, beer, and soft drinks.

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Uganda has about 32,000 kilometres (20,000 mi.) of roads; some 6,400 kilometres (4,000 mi.) are paved. Most radiate from Kampala. The country has about 1,300 kilometres (800 mi.) of rail lines. A railroad originating at Mombasa on the Indian Ocean connects with Tororo, where it branches westward to Jinja, Kampala, and Kasese and northward to Mbale, Soroti, Lira, Gulu, and Kapwach. Uganda's important road and rail links to Mombasa serve its transport needs and also those of its neighbours—Rwanda, Burundi, and parts of Zaire. An international airport is at Entebbe on the shore of Lake Victoria, some 32 kilometres (20 mi.) south of Kampala.

1.4 Political Stability

Since Uganda gained independence from Britain on October 9, 1962, the political situation in the country has been characterised by frequent periods of unrest and repression. However, the recent past has been a relatively peaceful time of reconciliation and economic rebuilding.

The first general elections in Uganda were held in 1961, and the British government granted internal self-government to Uganda on March 1, 1962, leading to full independence on October 9. Uganda maintained its Commonwealth membership. In succeeding years, supporters of a centralised state vied with those in favour of a loose federation and a strong role for tribally based local kingdoms. Political manoeuvring climaxed in February 1966, when Prime Minister Milton Obote suspended the constitution, assumed all government powers, and removed the president and vice president.

In September 1967, a new constitution proclaimed Uganda a republic, gave the president even greater powers, and abolished the traditional kingdoms. On January 25, 1971, Obote's government was ousted in a military coup led by armed forces commander Idi Amin Dada. Amin declared himself president, dissolved the parliament, and amended the constitution to give himself absolute power.

Idi Amin's 8-year rule produced economic decline, social disintegration, and massive human rights violations. In October 1978, Tanzanian armed forces repulsed an incursion of Amin's troops into Tanzanian territory. The Tanzanian force, backed by Ugandan exiles, waged a war of liberation against Amin's troops and Libyan soldiers sent to help him. On April 11, 1979, Kampala was captured, and Amin fled with his remaining forces.

After Amin's removal, the Uganda National Liberation Front ("UNLF") formed an interim government with Yusuf Lule as president. This government adopted a ministerial system of administration and created a quasi-parliamentary organ known as the National Consultative Commission ("NCC"). In June 1979, following a dispute over the extent of presidential powers, the NCC replaced President Lule with Godfrey Binaisa. In a continuing dispute over the powers of the interim presidency, Binaisa was removed in May 1980. Thereafter, Uganda was ruled by a military commission chaired by Paulo Muwanga. The December 1980 elections returned Milton Obote to power as president, with Muwanga serving as vice president. Under Obote, the security forces had one of the world's worst human rights records. In their efforts to stamp out an insurgency led by Yoweri Museveni's National Resistance Army ("NRA"), they lay waste to a substantial section of the country, especially in the Luwero area north of Kampala.

Obote ruled until July 27, 1985, when an army brigade, composed mostly of Acholi troops and commanded by Lt. Gen. Basilio Olara-Okello, took Kampala and proclaimed a military government. Obote fled to exile in Zambia. The new regime, headed by former defence force commander Gen. Tito Okello (no relation to Lt. Gen. Olara-Okello), opened negotiations with the insurgent forces of Yoweri Museveni, and pledged to improve respect for human rights, end tribal rivalry, and conduct free and fair elections. In the meantime, massive human rights violations continued as the Okello government murdered civilians and ravaged the countryside in order to destroy the NRA's support.

Negotiations between the Okello government and the NRA were conducted in Nairobi in the fall of 1985, with Kenyan President Daniel Moi seeking a cease-fire and a coalition government in Uganda. Although agreeing in late 1985 to a cease-fire, the NRA continued fighting, seized Kampala in late January 1986, and assumed control of the country, forcing Okello to flee north into Sudan. Museveni's forces organised a government with Museveni as president.

Since assuming power, the NRA-led government has largely put an end to the human rights abuses of earlier governments, established a human rights commission to investigate previous abuses, and instituted broad

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economic reforms after consultation with the International Monetary Fund (“IMF”), World Bank, and donor governments. A constitutional commission was named to draft a new constitution, which was adopted on September 22nd, 1995.

Insurgent elements and armed bandits in the north and west harass government forces and create a sense of insecurity, but they do not threaten the stability of the regime. Most notable are the Lord’s Resistance Army headed by Joseph Kony and supported by the regime in Sudan, the ADF rebels along the border with Congo comprised primarily of remnants of Mobutu’s army, and the Uganda National Resistance Army - Part II resurrected from the previously defeated West Nile Bank Front.

1.5 Trading Arrangements

Uganda has historically been allied with Kenya and Tanzania in an economic trading group. Although the East African Community collapsed amid much rancour in 1977, the revival of the East African co-operation has helped the three countries to co-ordinate development and trade opportunities. It has also led to an increase in the volume of trade between the countries. Statistics from the Kenya Bureau of Statistics show that the value of goods imported by Uganda has grown from 2.456 billion Kenya shillings in 1992 to 19.063 billion Kenya shillings in 1996. Ugandan exports to Kenya have also shown an increase although the balance of trade between the two countries greatly favours Kenya.

1.6 Urbanisation and Migration

Population projections made by the Statistics Department, Ministry of Finance and Economic Planning now put the urban population at 14.41%. An estimated 1,000,000 people now live in the capital of Kampala and its suburbs, compared to 774,241 during the census of 1991.

1.7 Education Levels

Improving the level of education has been a major goal of the government. In 1989, primary school enrolment was 60%, and the literacy rate was 52%. In 1996, a programme of Universal Primary Education The 1991 Population and Housing Census found that 11.3% of the population lived in urban areas. was instituted whereby students at the primary level are enrolled free of charge.

1.8 Plans for Future Development

The government’s plans for future economic development are directed towards three main areas: tourism, hydroelectric power, and agro-processing. While Uganda’s tourist destinations are more difficult to reach because of distance from major cities and transport hubs, emphasis is being placed on development of hotels and lodges within the game preserves. Major international hotel operators have been attracted to invest in these lodges.

Virtually all of the country’s electric power is provided by the Owens Falls dam on the Nile River. The country is currently experiencing a shortage of electric power, and load shedding schedules have been implemented in many locations. In response to the shortages, plans have been developed for a major new dam on the Nile, as well as smaller hydroelectric facilities on several other rivers around the country.

Finally, the government is hoping to increase the value of the country’s export goods by developing a domestic industry to process the country’s agricultural produce into finished products prior to export. The goal is to add as much value as possible to export goods in order to increase foreign exchange revenues. Agro-processing is being emphasised for coffee, tea, fisheries, and groundnuts.

1.9 Net Settlement Payments to UPTC

Senior UPTC staff state that international settlements are a major source of funding for the necessary buildout of the network, which is at a quite low level of penetration. The Auditor-General’s report on UPTC showed that turnover in 1996 was 49.9 million Shillings and in 1995 was 49.2 million. Of this, international telecommunications inpayments were 9.0 million and 9.1 million respectively in the two years, and international telecom outpayments were 5.8 and 5.3 million each year. Thus inpayments exceeded

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outpayments by a substantial margin in each year, and the net of the two figures constituted roughly 6 percent of total turnover.

2. TELECOMMUNICATIONS POLICY AND NETWORK DEVELOPMENT

This section examines:

- The statutory basis for, and functions of, UPTC;
- The Uganda Communications Act 1997 and the framework for the liberalisation of telecommunications;
- The likely changes that will result from the implementation of the new Act;
- An outline of Uganda's domestic network, services and other issues;
- An overview of Uganda's international facilities.

2.1 General regulatory framework

2.1.1 Current regulatory framework

UPTC was constituted under the Uganda Posts and Telecommunications Corporation Act 1983 ("UPTC Act")¹ to provide both postal services² and telecommunications services in Uganda. The East African Posts and Telecommunications Corporation previously provided these services. UPTC, under the auspices of the Ministry of Works, Transport and Communications, took over these services within Uganda in 1977.

UPTC is a parastatal company, which is wholly owned by the government.

Under the UPTC Act, UPTC is authorised to provide both telecommunications and radiocommunications services. UPTC is also able to offer cellular services. UPTC is responsible for regulating the telecommunications sector and is able to grant licences to other operators for the provision by them of telecommunications services. Licences have been granted for the provision of GSM cellular services (to CelTel, which is a consortium, including Vodafone), for trunked mobile radio operator services, (to Starlight Communications Uganda Limited or Starcom) and for the provision of Internet services (to date, five companies have been licensed to provide Internet services).

In January 1996, the government adopted a Telecommunications Sector Policy Statement (the "Sector Policy Statement"). The Sector Policy Statement sets out the government's objectives for the sector. These objectives include:

- Increasing teledensity from the current 0.25 lines per 100 people to 2.0 lines;
- Improving facilities and services and introducing new telecommunications services such as electronic mail; and
- Increasing the geographical distribution of telecommunications services.

In order to meet these objectives, specific targets were adopted, although no timeframe is given. These targets include:

- Improving call completion rates from 35% to 65%;
- Improving fault recovery rates to 60% within 24 hours and 95% within 72 hours;
- Upgrading the national network to achieve 75% digitalisation; and
- Increasing subscriber lines to a minimum of 300,000.

The Sector Statement set out the government's strategy for meeting these objectives. This strategy provides for:

- The repeal of the UPTC Act by a new telecommunications Act;

¹ Act 3 of 1983

² Postal services are not considered further in this Final Report.

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- Splitting off the postal and telecommunications functions of UPTC into Uganda Telecommunications Ltd (“**UTL**”) and Uganda Posts Limited respectively and, subsequently, selling off a proportion of the shares in UTL;
- Establishing an independent regulator;
- Licensing a second national operator;
- Fostering competition in the telecommunications sector.

A new Act, the Uganda Communications Act 1997 (“**UC Act**”)³, received presidential assent on 19 September 1997⁴. Although the UC Act provides for the repeal of the UPTC Act, the UPTC Act remains in force pending the creation of Uganda Communications Commission, the independent regulator, and the transfer of UPTC’s assets to each of UTL and Uganda Posts Limited. UPTC remains as the Uganda telecommunications operator and retains its regulatory functions. These functions are exercised through an “Final” Commission (for which, please see section 2.1.2 below).

2.1.2 Recent changes and likely future changes to the regulatory environment

The UC Act provides a framework under which a modern communications sector can be developed. The objectives of the UC Act include:

- Enhancing national coverage of communications services;
- Reducing government participation in the sector;
- Encouraging private investment; and
- Encouraging competition.

The UC Act will establish the Uganda Communications Commission (the “**Commission**”)⁵ who will be responsible for regulating the communications sector. In addition, its functions will include:

- Granting “Minor” licences⁶ for services such as paging, store and forward messaging, telex and telegraph services and value-added services;
- Advising the Minister on the grant of “Major” licences⁷ (the licences to be granted to UTL and to the second national operator will be Major licences and will authorise basic national and international telephony services, cellular services, trunk capacity resale services (i.e. leased lines) satellite services and third party private network services);
- Assigning radio frequencies;
- Establishing a tariff system to protect consumers;
- Developing and monitoring a numbering plan;
- Improving services and promoting competition;
- Representing the government at international fora.

The framework provided by the UC Act enables the government to bring a number of staged liberalisation measures into effect in the short to medium term. These measures, such as the licensing of the second

³ Act 8 of 1997

⁴ The UC Act was commenced on 26 September 1997. The formal creation of the regulator and the creation of UTL have not yet occurred.

⁵ The Commission has not been formally constituted. This will occur when the Commissioners are formally appointed, which may be delayed until late March. An interim staff of four people has been established, which is handling matters on an interim basis. Such matters include frequency assignment and licensing.

⁶ Minor licences are defined as licences for the provision of private network services by a service provider to non-affiliated private network users over leased lines.

⁷ Major licences are defined as licences for the provision of private network services by a service provider to non-affiliated private network users over lines any portion of which is owned by the service provider.

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national operator and the grant of licences for value added and data services are included in the government's draft offer of commitments under the World Trade Organisation ("WTO") Basic Telecommunications Agreement.

In particular, the government is proposing to adopt the regulatory disciplines set out in the Regulatory Reference Paper (the "**Reference Paper**"). Primarily, the UC Act will effect the separation of UPTC's operational and regulatory functions. The creation of the Commission should create a more open regulatory environment.

Much of the detail required by the Reference Paper will be put in place by way of licences and by regulations promulgated by the Commission. In particular, all major suppliers, which would include UPTC, will be required to offer cost-oriented interconnection rates to all service suppliers.

In the context of the international settlements regime, it is interesting to note that Uganda is proposing to take a Most-Favoured-Nation exemption for measures including differential accounting and settlement procedures entered into between the government and neighbouring countries, including Kenya, Tanzania and the Community of Eastern and Southern Africa ("**COMESA**") countries.⁸

The UC Act provides a framework for the incorporation of UTL. As at 8 December 1997, UTL has not been formally constituted but it is understood that UTL will be incorporated in within the next two weeks. UTL will have two shareholders. The Ministry of Works, Transport and Communications will hold a nominal share, with the remainder of the shares held by the Ministry of Finance. There will be 4 million shares of 25,000 shillings each, giving a total share capital of 100 billion shillings.

UTL will be privatised by way of sale of a percentage of shares to a strategic partner. The percentage has not yet been determined. After privatisation, the strategic partner will manage UTL in accordance with a management agreement with the government.

Following an amendment to the UC Act, which was adopted on 5 December 1997, the licensing of the Second National Operator was uncoupled from the privatisation process. The winning bidder for the Second National Operator Licence was the MTN/Telia consortium, which includes MTN, the South African mobile telecommunications operator, Telia Overseas AB, and two other members, Tristar and Investco, based in Uganda and Rwanda respectively.

2.2 Domestic Network

2.2.1 Overview

At the end of 1996 UPTC had 46,207 subscribers, and with a population of 20.4 million, the current teledensity is 0.23, one of the lowest in the world. Of lines in service, 70.8% are in the Kampala region. Most of the large towns are served by modern digital exchanges with a wide range of modern features. Digital switching and transmission systems have been installed in Kampala and three surrounding towns. Most rural areas are served by manual switchboards or radio call systems. A large part of the telecommunications facilities in northern Uganda were destroyed in the past (and current) unrest, and much of the remaining rural system has problems with ageing equipment and lack of spare parts. (Please note that portions of the following data were obtained from an ITU-sponsored study prepared by Dr. Fritz Ringling of Miami, Florida, in July 1997.)

2.2.2 Switching System

The existing network is composed of seven Area Switching Centres, of a combined mesh-star system. All major urban exchanges are served by digital switches. Some crossbar exchanges are also in use. The smaller exchanges are all manual and were commissioned in the 1970s, but the proportion of customers served is low.

⁸ These countries are Angola, Malawi, Mauritius, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe. Lesotho has withdrawn its membership. Mozambique has indicated that it will also withdraw.

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Two trunk switching units are installed in Kampala, one digital and one crossbar exchange. About 89% of Ugandan subscribers are connected to automatic switching equipment, while 1.3% are connected to step-by-step switches.

UPTC call completion statistics show that service quality is poor, with the call completion ratio at about 30% for local and national call attempts, only occasionally exceeding 70%. The ASR (answer to seizure ratio) for outbound international traffic averages 53.8% while the ASR for inbound traffic is about 40.3%. The traffic load measured in Erlangs per access line for Kampala in April 1997 was 0.09, for Jinja in was 0.08, for Mbale 0.07, and for Mbarara 0.06. The average holding time for local calls according to UPTC records is 3.0 minutes and for IDD calls was 2.9 minutes. The overall telecommunication system is reportedly not optimised, with mismatches between trunking, switching and outside plant capacity.

2.2.3 Transmission System

A new digital microwave system links Mbarara and Kabale, and also links with the Kampala- Masaka-Mbarara digital microwave system carrying traffic to Tanzania, Rwanda and Burundi.

A Kampala-Jinja-Nairobi analogue microwave link carries domestic and cross-border traffic to Kenya.

The transmission network is primarily designed in a star configuration with direct routes emanating from the major switching centres. Redundancy is provided on major but not all routes. UHF/VHF radio links and overhead lines with carrier equipment (analogue multiplexing equipment) cover the rest of the country.

The Mpoma earth station is connected to the international gateway switch in Kampala via a 140 Mbps fibre optic cable facility.

Much of the local cable network in the main switching centre areas was recently upgraded under a World Bank project. This programme addressed most of the feeder and distribution cable needs in the main switching offices. However, outside the main switching centre areas, local line facilities often remain in poor condition. Paper insulated cable is still used in suburban areas. Hence a substantial portion of the local cable plant is in urgent need of replacement.

The exchanges in rural areas are mostly manual and partially analogue and are linked to their transit exchanges with manual or semi-automatic circuits. These exchanges are connected to the transit centres by open wire lines employing subscriber carrier systems or small capacity radio links. Many regions experience power problems, with commercial power not available at all, or only available during limited hours.

2.2.4 Border Pay Phones

UPTC has installed pay phones in Kenya, close to the border, to allow customers in border communities to call Uganda for only the price of a local call. The Kenya Post and Telecommunications Corporation has done the same in Uganda. Note however that this only works from designated pay phones, and that a call to Uganda from a private phone next to the border to a phone in Kenya right next to the border will be routed through Kampala and Nairobi. The call will be charged at the national long distance rate (not the international rate, since the two countries are in the same telecommunity).

In the Pan-African Telecommunications Union (“PATU”) cost study it is noted that this type of “frontier traffic” should not be counted as international traffic for accounting rate or other purposes (please see section 4 for further details of this study).

2.2.5 UPTC Subscribers

At the beginning of 1997 UPTC had installed switching capacity of 78,632 lines, and 46,027 subscribers. Of these, 43,660 capacity and 32,696 subscribers were in the Kampala area.

The waiting list is reported in ITU statistics for 1996 as about 6,280. UPTC notes that the waiting list in Kampala is about 900 and the typical waiting time is about 3 months, although this can go higher. Several years ago the waiting list was often up to two or more years

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2.2.6 UPTC Operations

At the end of 1996 UPTC had about 2,600 employees, of which 700 were temporary. Of the 2,600, it is estimated that about 1,240 were directly engaged in telecommunications operations (as opposed to post), with about 70% of common staff doing telecommunications overhead work. This equates to a total telecommunications workforce of about 1,800, for an efficiency ratio of about 26 access lines per employee.

2.2.7 UPTC Challenges and Expansion Plans

UPTC sees its major challenges and plans as those set out in the Sector Policy Statement (for which, please see section 2.1.1 above) :

- Improving teledensity in line with the target of 2.0 lines per 100 population. Demand over the next five years is projected to be 300,000 lines by 2002 and that demand should be met. (Please note that Ringling's ITU report states that if all demand is met by supply, and that if access lines, mobile phones, and pay phones are built out to meet demand, then "our demand forecast for Uganda anticipates the combines service teledensity to increase from the 1997 level of 0.26 to 1.92 by 2006, very close to the target range of 2.0 outlined in the ministerial document.")
- Improving call completion and fault recovery in line with Sector Policy Statement targets;
- The national network should be at least 75% digital.
- Maximum connection time for new applications should be two weeks in urban areas.
- New services should be added in areas such as electronic mail, paging, voice messaging, low cost data distribution and cable distribution of image services.
- A new numbering plan should be introduced which promotes growth of new services and is fair to competitors.

Dr. Ringling's study predicates various ambitious assumptions, including: that demand for access lines and mobile wireless service is met by the operators, that all calls are completed, that the economy continues to grow at a rate forecasted by the World Bank, that accounting rate declines are passed through to the subscribers and that tariffs are rebalanced. If all these assumptions and conditions are met, the required investment will fund a rise from 49,000 access lines to 380,000 and meet potential demand for 84,300 mobile subscribers by 2006. The cost for this will range from \$1.1 to \$1.4 billion USD for wireline and \$89 million to \$106 million for wireless services. (Ringling employed the ITU regression model used by the NTT Consulting Group for the preparation of the 1993 UPTC Master Plan, updated to include the latest available economic data.)

Dr. Ringling also anticipates that demand for pay telephone installations will 33,000 by 2006, thus reducing the average number of inhabitants per pay phone from the current 20,000 to 776.

A JICA-funded (Japanese International Co-operation Agency) master plan was undertaken by NTT in 1993, with a 15-year time horizon. But according to UPTC this has largely been superseded by informal changes and developments, and hence is not appropriate to use a reference document now. No similar formal master plan now apparently exists, although particular projects have individual plans. Two major projects currently in the planning include a fibre optic ring around Lake Victoria, linking Uganda, Tanzania and Kenya; and a digital microwave transmission system from Kampala westwards to Fort Portal.

2.2.8 UPTC Financing of Future Expansion

Potential sources of funds to finance the ambitious expansion goals include self-financing, international settlements, loans and privatisation.

Self-Financing. According to the Auditor General's report of August 27, 1997, UPTC had a profit for 1995 (July - June fiscal year) of 4.6 billion Shillings on a turnover of 49.2 billion Shillings and assets of 75.1 billion Shillings. For 1996 the figure was a loss of 35.8 billion on a turnover of 49.9 billion and assets of 98.4 billion. For 1997 it is informally estimated that UPTC made a very small profit of about 5 million Shillings. (For all these figures a conversion rate of 1050 Shillings to \$1 USD is usable.) The large loss in 1996 was apparently caused by a combination of lack of controls on a large number of cash transactions, and high non-payment by Ministries, parastatals and individual customers. Other major concerns with regard to

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UPTC's financial abilities include issues of pension liability and funding, and back tax assessments estimated and disputed at between 41.8 and 60 billion Shillings. Thus these figures raise the question of whether UPTC can attain its goals based on self financing.

Projecting or modelling future financial flows of UPTC in this uncertain environment would appear to be quite problematic.

International Settlements. For 1995, roughly 6% of UPTC's annual turnover was accounted for by net settlement payments (for which please see section 1.9 above).

International Loans. UPTC had seven loans with outstanding liabilities in 1996, to IDA (2 loans), the African Development Bank, French protocols, the Korean project, a Spanish loan, and Intelsat. Securing additional loans given the uncertain nature of UPTC finances could perhaps be problematic.

Privatisation. Under proposed legislation UPTC could be privatised in the next year or so. This would appear to be the most likely viable source of funding for major expansion of UPTC's network.

2.2.9 Other Networks in Uganda

UPTC is far and away the dominant player in all telecommunications areas in Uganda. However, there are some other enterprises worth mentioning. These include:

CelTel. This is a private GSM operator with close to 5000 subscribers. It operates in the Kampala and Jinja areas and has been in operation since the spring of 1995.

StarCom. This private operator has three divisions: a trunked mobile radio network, an international data network, and a pay phone system. There are about 6000 to 7000 customers altogether.

The trunked mobile radio system provides dial tone and access to the UPTC telephony system. The international data gateway provides satellite-based access to foreign locations. The gateway is mounted on the roof of the Sheraton Hotel and provides direct access overseas. Traffic through this gateway does not need to pass through the UPTC network. The pay phone operation has about 100 pay phones, and telecentres in Jinja and Mbarara.

Paging Operations. Several paging systems have been licensed. One is in operation and has been operational for a year.

Parastatal and Government Organisations. Uganda Railways Corporation, Uganda Electricity Board, and government organisations such as the Uganda Police Force and Uganda Peoples Defence Force have and operate their own private telecommunications networks. These are primarily radio networks, although UEB has connected its Kampala offices with a fibre optic cable. There is no public discussion as yet of any of these networks providing public services or forming the basis of a Second National Operator.

NGOs. Non-governmental, non-profit organisations such as the United Nations have their own radio communications networks, primarily in the HF/VHF bands.

2.3 Overview of International Network

2.3.1 International Numbering Plan and its Consequences.

All countries in the east African telecommunity (Uganda, Kenya, Tanzania, Rwanda, and Burundi) share the heritage of the old East African Posts and Telecommunications Corporation, which broke up in 1977. This has resulting in interesting numbering plan and other consequences. Each country has its own three digit country code (++256 for Uganda). But calls within the five countries in the telecommunity (Uganda, Kenya, Tanzania, Rwanda and Burundi) do not require country code dialling. Only national long distance codes are used. Within these countries two digits are set aside for area codes. These digits are allocated as follows: 1x, 2x and 3x for Kenya, 4x for Uganda, 5x and 6x for Tanzania, 7x for mobile in all three countries (with 70xxxxx set aside for dialling Rwanda and 71xxxxx set aside for Burundi), 8x for other special such as paging, shared by all three countries, and 9x for emergency numbers, shared by all three countries. An "escape code" of zero is used in Uganda before dialling locations in Kenya, Rwanda, Tanzania and Burundi.

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After the two digit area code, up to six digits in Uganda are utilised for local exchanges and numbers. Most numbers in Uganda utilise all six numbers, although some have four or five.

The results of this heritage and numbering plan are interesting. All countries in the telecommunity treat calls to other countries in the telecommunity as national long distance for purposes of dialling, not as international calls. Hence normal international tariffs are not applied. Data on cross-border intra-telecommunity traffic are not generally recorded, since national long distance pulses are lumped in with local pulses. So cross-border, intra-telecommunity traffic must be estimated.

All intra-telecommunity traffic is settled on a sender keeps all basis. (The only partial exception would be if a microwave link from one country to the other in the telecommunity was down, and the backup was a satellite. Then the transiting administration would be paid a transit fee. But even then the terminating country in the telecommunity would not pay a termination fee to the originating country.) There is no transit charge if a country in the community carries through traffic to another country in the community.

The lack of number blocks is starting to cause numbering problems in Uganda and Kenya. Uganda, with only a 4x designation within the major countries in the telecommunity, is especially disadvantaged. (Rwanda and Burundi are also disadvantaged, with quite small numbering blocks.) This is particularly true since Uganda is in the process of liberalising its sector faster than its large neighbours, and therefore needs more numbering blocks for the different competitors entering the sector. Uganda, represented by the Commission, is considering various options for revising the numbering plan, including increasing the two digit area code to three digits, abandoning the east Africa regional plan and use international dialling, and continuing the current system with the new second national operator being given unused area codes or sharing these codes with the dominant carrier.

2.3.2 International Network Outside East Africa

The UPTC international network links Uganda directly to several European, North American and African countries. Specifically, direct links have been established via satellite with the USA (AT&T, 2 Mbps, 30 channels and MCI, 2 Mbps, 60 channels); Canada (30 channels shared by two carriers); the UK (BT, 2 Mbps, 60 channels); Italy (1 Mbps, 16 channels); France (FT, 1 Mbps, 16 channels); Germany (DT, 512 Kbps, 8 channels); Switzerland (512 Kbps, 8 channels); South Africa (512 Kbps, 14 voice and 1 data circuit); Belgium (512 Kbps, 8 channels); and Sweden (Tele 2, 512 Kbps, 8 channels).

These links are carried by the Mpoma earth station, near Kampala, which is a Standard A Intelsat earth station. This station has recently been upgraded and refurbished.

UPTC has been approached by various administrations and potential customers to act as a hub for the east Africa region, especially for traffic routing to Kenya and Tanzania. But it has yet to act on this suggestion, and UPTC staff have some doubts that this can or should be accomplished. This is apparently due to the high degree of co-operation between the three parastatal operators in the East African community (Uganda, Tanzania and Kenya), and the desire to avoid undercutting community partners.

2.3.3 International Network Within East Africa

UPTC also has direct microwave links (mostly analogue) via the Panaftel (Pan African Telecommunications System) network to Kenya, Ethiopia, Eritrea, Tanzania, Rwanda and Zambia.

Panaftel is used mainly for backup to satellite, for reaching the more distant countries. Figures for paid minutes for 1996 show that the northbound and southbound Panaftel routes had 106,667 total minutes, a small 0.5% of the total 19,532,507 incoming and outgoing paid minutes for the country.

Within the east African telecommunity, microwave is used almost exclusively, although a satellite link might be used as a backup occasionally if a microwave link is down. Traffic to Kenya is routed over an analogue microwave link southeast toward Nairobi. Traffic to Tanzania was routed until September 1997 through Kenya along the eastern shore of Lake Victoria, but this traffic is now routed west around Lake Victoria via a new digital microwave system. This routing avoids having a third administration (Kenya) as part of the system, improves reliability, is lower cost, and replaces analogue with digital service.

To reach Rwanda and Burundi, a digital microwave link heads southwest from Kampala, around Lake Victoria first to Rwanda and then to Burundi.

3. EVOLUTION OF INTERNATIONAL TELECOMMUNICATIONS ENVIRONMENT

This section provides:

- An outline of the regulatory status of international services;
- An overview of trends in international traffic;
- An overview of trends in international accounting and settlement rates.

3.1 Regulatory status of international services

Currently, only UPTC is authorised to provide international voice telephony services. All international voice calls are meant to be routed through UPTC's gateway but it is understood that call-back services are being offered (please see section 2.2.9 above).

However, the second national operator will be licensed to provide international services, thus providing for competition between UTL (i.e. the corporate entity into which UPTC's operating assets will be transferred) and the second national operator for the conveyance and termination of international calls.

Call-back is prohibited under regulations made by UPTC under the UPTC Act. This would not prevent the Commission from revisiting this prohibition and reversing it in the future.

Starcom (for which please see section 2.2.9 above) is authorised to provide public payphones and to operate an international data gateway. It is alleged that Starcom is using its international gateway and pay phones to operate a sophisticated call-back voice system which bypasses UPTC. This is allegedly in violation of StarCom's licence. Starcom's prices for this service undercut UPTC by 40%, until the recent September 1 UPTC price drop. This matter is being investigated by UPTC.

CelTel may only provide international services through UPTC's gateway. It is not able to establish and operate its own international gateway.

It is understood that call-back is offered in the payphones located in certain hotels. In addition, international dialling is offered from call centres. UPTC is currently investigating this matter.

No licences authorising the provision of International Simple Resale services in Uganda have been granted.

The provision of voice over the Internet is not an issue in Uganda as yet. The five existing Internet service providers (who were licensed by UPTC) do not currently control sufficient capacity to support the provision of Internet voice telephony.

The telecommunity of Uganda, Kenya, Tanzania, Rwanda and Burundi is worth mentioning in the context of international services. The telecommunity, which provides for national long distance rates between these countries, is not a legal requirement but an example of regional co-operation.

3.2 Trends in international telephone traffic and prices 1990-1996

3.2.1 General Price Trends

Before 1990 outgoing tariffs were quite low. On July 1, 1990 a sharp price increase was instituted, to \$7.50 per minute for major destinations. On July 1, 1992 this high rate was dropped to \$5.00/minute for all destinations (organised into three bands of destination countries outside east Africa). On July 1, 1994 the rate was dropped from \$5.00 to \$3.00 per minute for all bands. On September 1, 1997 rates were again dropped, from \$3.00 to \$1.50 per minute. (This latter figure is 1800 Ugandan Shillings for Band 1 countries including the US, Canada and most of Europe; all prices are levied in shillings but the UPTC thinks in dollar terms for comparison purposes and to see if it is in line with world trends.)

The recent 50% price drop was driven by several factors. First was a 1996 study under the auspices of the Pan African Telecommunications Union of the cost of call termination. According to UPTC staff, this study found that the cost of termination for the six countries in the east Africa region, including Uganda, was about 60 cents US per minute, with most countries clustered closely around this figure. This study was done on a fully distributed historic cost basis. This meant that international rates should be set at a target of about

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\$1.50, since this would yield inpayments to Uganda of about \$0.75 per minute, \$0.15 above the cost of \$0.60. This yields a profit of about 25%, substantial but not outrageous.

The second factor driving the large price drop was world industry trends and international political pressures, observed by Uganda.

The third factor was the desire to remain competitive within the east African telecommunity, which do not charge international rates between each other, but which negotiate external international settlements separately. UPTC feels that if its rates remain higher than others in the telecommunity, Uganda may lose traffic to a hub in the region.

The fourth factor was the pressure from call-back. Although call-back is prohibited in Uganda, losses are fairly substantial, and are estimated by UPTC at about \$140,000 USD per month or more, prior to the recent September 1997 price drop. After September UPTC estimates it will still lose about \$70,000 per month to call-back, but anticipates that the lower rates will discourage customers from attempting to use call-back. UPTC alleges StarCom was providing call-back via an international data gateway, with price discounts of 40% off UPTC's pre-September 1997 rates. (Internet telephony is not yet active in Uganda.)

3.2.2 Detailed Trends in Settlement Rates

Negotiation Principles Utilised for International Settlement Rates

UPTC is constantly renegotiating agreements with the 220 plus administrations around the world. In negotiating these agreements UPTC follows these principles:

First, avoid drastic price changes that will shock customers or other administrations.

Second, if the need for a substantial price change is identified, make several smaller phased changes rather than one big change.

Third, keep prices for major destinations, such as the US and Japan, roughly in line.

Fourth, in the latest price change, use cost-based analysis (especially the recent PATU study) to set prices.

Fifth, reflect world and east African telecommunity pricing trends.

Sixth, in the latest price change, reduce and try to eliminate cross-subsidies between services. UPTC acknowledges that prior to September 1997 it, like many operators in developing countries, had substantial subsidies from international to local and to national long distance calls. There were also subsidies from national long distance to local calling. The September 1997 price changes attempted to eliminate these cross-subsidies. There was not a major cost study of all services to determine the true cost of service, but the PATU study of call termination costs was used, and the impressions of management of the relative costs of service was employed. UPTC feels that it has now approximately aligned prices with costs of service for international, national and local service, although senior UPTC management strongly support the concept of an in-depth cost analysis of Ugandan and other developing country telecommunication network cost elements, to elevate the level of debate about collection and accounting rates.

Seventh, negotiate at least three and preferably seven to ten agreements with different routings to reach each destination, both incoming and outgoing. This creates price competition and allows for alternate routing if a particular route goes out.

AT&T USA Direct

Since 1992 UPTC has had two AT&T USA Direct telephones installed, at the main post office and at the main customer service office in Entebbe. These phones are the only location in Uganda from which AT&T USA Direct, the only country direct service with a foothold in Uganda, can be obtained. These phones were designed as an experiment, but the experiment has been prolonged since Kenya next door cancelled its country direct services and Uganda is waiting to see what will happen in the region. During 1996 Uganda had full USA Direct service but this was cancelled shortly after Kenya cancelled its similar service. UPTC figures show that the two experimental USA Direct phones generated 70,208 outgoing minutes in 1996 and 42,355 incoming minutes. This compares to the total 3.0 million incoming and outgoing paid minutes using the 30 AT&T satellite channels to and from Uganda.

UPTC plans to introduce full USA Direct and other country direct services into Uganda in 1998.

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3.2.3 International Traffic Trends

Until 1990 Uganda had no direct international dialling, and all calls were manually connected and set up by operators. During this manual period Uganda had substantially more outgoing than inbound traffic. Substantial fraud existed during this period, with many customers using the service then avoiding payment, despite the low tariffs. With the introduction of direct dialling in 1990 and the raising of international calling rates, the calling trend has reversed, so that now incoming exceeds outgoing by a 2.4 to 1 ratio (13.7 million to 5.8 million minutes for 1996). The figure for 1997 through October is 2.7 to 1, so the trend is continuing.

Estimates of Current Traffic within East Africa

As mentioned above, traffic within the five east African countries is not recorded separately and estimates must be used. UPTC states that the circuit method used by UPTC and the ITU yields acceptable estimates. This simply takes the number of working circuits which are assumed to be fully utilised (which seems reasonable given local conditions in Uganda) times 60,000 paid minutes per year. The table below shows the average number of working circuits incoming and outgoing to the other countries for a six month period ending in December 1997, and the resulting estimate of minutes per year.

Table 3.1: Incoming and outgoing circuits

<i>Destination Country</i>	<i>Incoming or Outgoing Circuits</i>	<i>Average Number of Working Circuits</i>	<i>Est. of Paid Min/ Yr. (Avg. No. Circuits x 60k min.)</i>
Kenya	Outgoing	68	4,080,000
	Incoming	65	3,900,000
Tanzania	Outgoing	25	1,500,000
	Incoming	35	2,100,000
Rwanda	Outgoing	12	720,000
	Incoming	13	780,000
Burundi	Outgoing	7	420,000
	Incoming	10	600,000
TOTAL OUTGOING			6,720,000
TOTAL INCOMING			7,380,000
TOTAL TRAFFIC			14,100,000

Source: UPTC

Note various trends here, from this admittedly crude analysis:

- Kenya is by far the largest traffic partner. It's incoming and outgoing traffic with Uganda are reasonably balanced, so the SKA approach is probably little different from a 50-50 settlement rate. Rwanda is similar.
- Tanzania and Burundi send substantially more traffic incoming to Uganda than Uganda sends to these two countries. Therefore the SKA system harms Uganda, compared to changing to a 50-50 negotiated settlement rate.

Data on circuits prior to 1997 were not available at the time of writing, so even this simple analysis could not be performed in time series.

A detailed analysis of international traffic patterns is attached at Annex I.

3.2.4 Current National and Local Traffic

Ringling's study was unable to determine current national and local traffic based on actual data. Instead, UPTC and Ringling estimated that local calls account for about 84% of traffic volume, national calls,

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including east Africa, account for 14% of all traffic volume, and international outbound traffic reached 2% of all the entire traffic volume.

3.2.5 Traffic Forecasts

Dr. Ringling's study of traffic includes a forecast which assumes that demand for access lines and mobile wireless service is met by the operators, that all calls are completed, that the economy continues to grow at a rate forecasted by the World Bank, that accounting rate declines are passed through to the subscribers, and that tariffs are rebalanced. Under these possibly ambitious assumptions, the following traffic forecasts are made, mostly focused on the "potential traffic" that could be realised:

- Potential outbound international traffic could reach 35.5 million minutes in 1997 under Ringling's baseline scenario, compared to anticipated actual traffic of about 7.0 million minutes under steady state conditions. Note that the actual figures for outbound international (non-east Africa) traffic were 5.8 million for 1996. For 2001 and 2006 Ringling anticipates outbound traffic to increase to 55.5 and 92.5 million minutes respectively.
- Potential inbound international traffic for 1997 could be as high as 80.0 million minutes under Ringling's assumptions. (Actual 1996 volume was 13.7 million minutes.) By 2001 and 2006 Ringling estimates potential volume at 111.6 and 175.9 million minutes respectively.
- Ringling estimates actual national call minutes at 49.0 million in 1997 and 40.7 million minutes in 1996; if his assumptions were met he estimates potential minutes for 1997 could be 248.2 million. For 2001 and 2006 he estimates potential volume could reach 389.0 and 647.7 million respectively.
- Ringling estimates 1997 actual local traffic at 290.0 million minutes and 1996 at 244.0 million minutes, whereas potential volume under his assumptions could reach 1.5 billion in 1997. By 2001 he anticipates that potential traffic could surpass 2.3 billion minutes and for 2006 the figure could be 3.8 billion.
- Ringling notes that even these dramatic increases in volume would not increase actual traffic per access line unreasonably, with traffic per access line increasing from an actual of 0.07 Erlangs in 1997 to a potential traffic range of 0.07 to 0.08 Erlangs in 1997, and 0.08 to 0.10 Erlangs in 2006. The master plan prepared for UPTC in 1993 by NTT anticipated an increase in traffic per line even higher, of 0.7 in 1994 rising to 0.14 in 2010.

If all these assumptions and conditions are met, the required investment will fund a rise from 49,000 access lines to 380,000 and meet potential demand for 84,300 mobile subscribers. The cost for this will range from \$1.1 to \$1.4 billion for wireline and \$89 million to \$106 million for wireless services.

A more pessimistic and perhaps realistic forecast of traffic is possible using recent actual figures for traffic volumes of paid minutes. The table below shows the actual figures for 1991-96 and a straightline projection for 2006, assuming a continuing rate of increase of 26.4% growth per year. The resulting figure for 2006 under this calculation is 203 million minutes, more than an order of magnitude lower than Ringling's 3.8 billion minutes.

Table 3.2: Incoming and outgoing international traffic

<i>Year</i>	<i>Actual O/G Paid Min. (millions)</i>	<i>Actual I/C Paid Min. (millions)</i>	<i>Total Min. (millions)</i>
1991	4.2	4.2	8.4
1992	3.3	5.3	8.5
1993	2.7	6.9	9.6
1994	3.5	10.4	13.9
1995	4.9	12.3	17.2
1996	5.8	13.7	19.5
2006 (projected at 26.4% CAGR)			203.0

Source: UPTC

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Note the trends in incoming and outgoing calls shown in the table. While incoming and outgoing were exactly balanced in 1991, incoming has moved to exceed outgoing by a ratio of 2.4 to 1. Possibly with the recent drop in collection charges for outgoing calls, this trend will slow.

3.2.6 Investment Cost Per Line

Dr. Ringling, in his recent ITU report, uses a modified 1994 ITU Sub-Saharan Africa figure of \$5,500 per line as being appropriate for Uganda's typical cost per line for new construction. He modifies the figure to \$5,000 per line currently, declining 10% per year. UPTC estimates this figure at about \$4000 to \$5000 per line.

3.2.7 Pricing of Services

Pricing under the colonial administration was done on a distance basis, with 8 distance bands of prices. This has changed over time to the following multipart system (for customer dialled calls, standard time of day rates):

Note some interesting highlights of this system:

- The East African countries generally operating under the SKA system have call prices about 2.5 times the national rate, but less than half the international rest of world Band 1 rate.
- COMESA countries outside East Africa, which settle using the traditional accounting rate system, are given a discount of about one-sixth off the international rest of world Band 1 rate.
- The countries of most interest and most vocal about accounting rate problems (such as the US) now (since September 1997) have a relatively low \$1.50 collection rate charge. (It is this charge that ties into the cost based PATU study now used by UPTC in targeting its pricing.)
- UPTC states that Band 3, the high band charge almost twice the Band 1 rate, is targeted especially for countries which refuse to drop their collection and accounting rates.
- Collection rates for Band 1 countries have dropped by about 50 percent in dollar terms, from \$3 to \$1.50, effective September 1997.
- Band 2 and 3 countries collection rates have also dropped very substantially, effective September 1997.

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Table 3.3: Domestic and International tariff schedule and changes

<i>Call Destination Category</i>	<i>Duration (Sec/75 Shilling Unit) (From Sept. 1, 1997)</i>	<i>Charge Per Minute (Ug. Shillings, excluding VAT) (From Sept. 1, 1997)</i>	<i>Duration per Unit Fee of 50 Sh.; or Charge Per Minute (Shillings) (1995—9/1/97)</i>
Local (within 1 exchange area)	60 Sec.	75 Sh.	30 Sec.
National (between exchanges inside Uganda)	18	250	Varies by distance from 15 to 4.28 sec.
PCN (Cellular)	7	650	--
East Africa & Kagera Basin Org. (Uganda, Tanzania, Rwanda, Burundi)	7	650	1000 Sh.
COMESA (outside EA & KBO but inc. S. Africa) (Angola, Botswana, Comoros, Djibouti, Eritrea, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Somalia, S. Africa, Sudan, Swaziland, Zaire, Zambia, Zimbabwe)	3	1500	2000 Sh.
International (Rest of World)			
Band 1 (high traffic, low acting rate countries) (includes US, UK, Germany, Belgium, Canada, Sweden, France, Switz., Iran, etc.)	2.5	1800 (about \$1.50 USD)	4000 Sh. (about \$3 at then exchange rates)
Band 2 (mod. Traffic countries) (incl. Austria, China, Czech, Israel, India, Russia, Saudi, Niger, Lebanon, Kuwait, Jordan, etc.)	1.8	2000 (about \$1.67)	4000 Sh. (about \$3.00)
Band 3 (low traffic and/or high acting rate countries)(including W. Africa Francophone countries, Pakistan, Liberia, Iceland, El Salvador, Vietnam, etc)	1.5	2350 (about \$1.96)	4000 Sh. (about \$3.00)
Inmarsat	-	9000	--

Source: UPTC

3.3 Trends in Accounting and Settlement Rates

Recall that Uganda generally uses a Sender Keeps All system with other East African countries. Therefore this review will cover only agreements with non-East African countries, or agreements used as backups via satellite to the SKA--East Africa system.

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This section outlines what the Accounting Rate Exhibit, (the “**Exhibit**”) at Annex II to this Report, represents.

The attached Exhibit shows key elements of accounting rate agreements with major traffic partners of Uganda, as well as with other countries of interest in the ITU/CTO/EU case study effort.

The data in the Exhibit were obtained from UPTC’s file on accounting agreements, which was a five inch thick compilation of all the typed summaries or printouts of all the 2000 plus accounting agreements that UPTC maintains with the 220 plus telecom administrations around the world.

The UPTC compilation shows agreements dating back to the early 1980s, with comprehensive listings compiled in 1992. Hence this Exhibit and analysis focuses on trends from 1992 through 1998. But it is clear from reviewing the compilation and interviewing staff that in the 1980s and early 1990s very little changed in accounting rates, and early 1980s agreements were often used well into the 1990s. Hence although the Exhibit covers only 1992 through 1998, in a sense this Exhibit shows almost 16 years of history.

The Exhibit shows the year in which the accounting rate agreement was utilised, the country (and carrier if the country has more than one), the total accounting rate and the currency used (SDRs are Special Drawing Rights, GFC are Gold Francs, USD are US dollars), and the traffic type. This latter is generally “both ways,” meaning that inbound and outbound traffic is covered, but occasionally it is incoming (IC) or outgoing (OG) only, or the information was not available (NA). The Exhibit also shows the type of accounting as “cascade” or “direct” (CA or DA). Cascade accounting means that if, say, Uganda pays AT&T for transiting calls to Albania, then UPTC will pay AT&T for the AT&T transit portion as well as paying AT&T for the Albanian destination charge, and AT&T will keep its portion and settle the destination charge with the Albanians. A direct accounting in this example would mean that UPTC would settle directly with AT&T for its transit charge, and would settle directly with the Albanians for the destination charge. These settlements are done quarterly. Most administrations settle promptly but some do not pay their accounts for months or years.

The Exhibit also shows how much the originating administration retains of the total accounting rate amount. It then shows for some recent agreements the “confidential transit charge.” In the last several years a number of major transiting organisations, including MCI, AT&T, STET and others have had “official” transit fees (also shown in the Exhibit) and confidential fees that are not publicised but appear to be attempts to entice other administrations to use their services.

The Exhibit then shows the transiting administration. Here “direct” generally means that there is no transiting administration and hence no transit fee, although in a few cases a direct provider apparently charges a confidential transit fee. Next is shown the destination charge, then when the agreement became effective, and whether the agreement was used during the year concerned (the first column) as a vehicle for routing major traffic (MT), or only as a backup traffic (BT) vehicle.

Note that UPTC tends to keep in force ALL agreements negotiated over the last 20 years, even if the rates are quite high, and hence has over 2000 agreements in place. This is because UPTC uses these older agreements as backups, in case the links used for the newer agreements fail and alternate links must be used temporarily. In this way traffic is sent through, although UPTC does not make as much money or could even lose money on the transaction.

Note also that in the original source documents there are occasionally two transiting administrations and two transit charges. For example, in sending traffic to Angola, UPTC links first to London via satellite, then to Lisbon, then to Angola. This is fairly rare, and none of the selected countries in the Exhibit have such an arrangement.

3.3.1 Detailed trends in International Accounting Price Rates

Moving now to a discussion on the trends in accounting rates with various administrations, we can note the following from the Exhibit:

- With regard to the USA, UPTC has generally used AT&T as its partner, although Sprint got a major share of traffic in 1996/7. MCI has been used as a backup provider. For example, in 1996 MCI had an arrangement with UPTC and British Telecom in which UPTC and MCI each received \$0.325 and BT retained \$0.55 as a transit fee. From 1992 through 1995 the accounting rate with AT&T was \$1.50 with

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the usual 50-50 split. The accounting rate with AT&T dropped at the beginning of 1997 to \$1.00. Thus the arrangements with the US follow the usual 50-50 split of accounting rates, with rates dropping about 30% (\$1.50 down to \$1.00) during the 1992 to 1997 period.

- The agreement with the UK (BT) dates back to 1982 and was still the major traffic agreement in 1992. This agreement was the usual 50-50 split, of 1.20 SDRs. This rate went up to 1.40 SDRs in 1995 and down to 1.00 SDRs in 1997, for a drop over the period of about 17% from the beginning to the end of the period.
- For Canadian traffic, at the beginning of the period, in 1990 through 1993, traffic was transited through Germany with a total accounting rate of 1.00 SDRs, with 0.29 going to the originating and 0.29 going to the terminating administrations, and 0.42 SDRs retained by the German administration. In 1995 a direct relationship was negotiated, with the rate dropping to 0.70 SDRs split 50-50, dropping further to 0.40 SDRs by 1997. Thus rates dropped a total of 60% during the 1990/2 to 1997 period.
- For Indian traffic, from 1989 through 1992/3, UPTC transited traffic through Nairobi, had a total accounting rate of 1.66 SDRs, and paid Kenya 0.42 for this transit fee and split the remainder 50-50 with the Indian telco. By 1997 rates had dropped about 23%, to 1.28 SDRs, with Startec taking a small 0.18 transit fee and the balance still split 50-50.
- For South African traffic, from 1991 through 1993, traffic was transited through Germany at a total accounting rate of 1.96 SDRs with the Germans retaining 0.40 and the balance split 50-50 in the usual way. Rates dropped throughout the period, so that by 1997 the total accounting rate was down 49%, in a direct relationship with the South African administration, no transit fee, and the usual 50-50 split.
- Traffic for Japan began the period at a rate of 1.60 SDRs, transited through Nairobi at a charge of 0.42 and the usual 50-50 split of the balance. In 1996 a new arrangement with STET was signed lowering the overall rate officially to 1.30, with the Italians officially retaining 0.390 as a transit charge but actually and confidentially charging 0.290. (Note that while the official rate was 1.30, the actual rate was the sum of 0.455 plus 0.290 plus 0.455, or 1.135) In 1997 the Italian administration lowered the confidential transit charge to just 0.120, while retaining the official transit charge at 0.390. Thus the total actual accounting rate at the end of the period was 1.03, a drop of 36% from the 1.60 at the beginning of the period. The usual 50-50 origination to termination split continued throughout the period.
- Accounting rates with Germany declined by a dramatic 69% during the period, while rates with France dropped by 49%.
- Accounting rates with various low traffic volume administrations show interesting and perhaps non-rational patterns. For example, traffic with Lesotho has utilised the same BT arrangement of 0.46 transit fee from 1989 through the present, despite the fact that backup agreements with much lower transit fees have been in place since 1995 with MCI. This appears to violate one of UPTC's stated goals of minimising transit fees. The likely explanation is that the traffic volume is low enough that it is not a focus for UPTC staff. Thus here accounting rates did not fall at all. A similar example is the Bahamas, where throughout the period accounting rates remained officially at \$3.55 USD, in an arrangement with AT&T. While AT&T did lower its official transit fee in 1996 to a confidential 0.24 from a previous official charge of 0.48, thus lowering the overall real accounting rate to \$3.31 (1.535 plus 0.24 plus 1.535; a drop of 7%), it is curious that UPTC did not choose MCI, which offered a total rate of \$2.534 USD (\$1.81 times a conversion rate of 1.4). Perhaps here UPTC was minimising the transit fee (\$0.24 for AT&T vs. \$0.308 for MCI (0.22 times 1.4 conversion)).
- With Mauretania a different but similar pattern emerges. Throughout the period a high cost 9.00 GFC arrangement transiting through France with FT retaining 1.30 has been utilised. This is true despite the fact that since 1995 a backup agreement with MCI could have provided slightly lower accounting rates of 8.88 GFCs (2.94 SDRs times a conversion rate of 3.061) and (in 1997) a low confidential transit fee to MCI of 0.67 GFCs (0.22 times 3.061). Here UPTC staff stated that they are intentionally keeping rates high with Francophone West African countries which refuse to lower their rates. By switching to MCI, however, UPTC could lower its transit fee costs while keeping overall costs about the same.
- For Sri Lanka, Colombia, Switzerland, UAE, Italy, Sweden, Netherlands, Denmark and Egypt the main story is similar: official accounting rates dropped substantially during the period, while they dropped

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even more in some countries when confidential, low transit charges are taken into account. For example, in Sri Lanka accounting rates were 2.70 SDRs at the beginning of the period with BT taking 0.44 for a transit fee; by the end of the period official rates had dropped 39% to 1.66, and real rates had dropped by 43%, to 1.53, when a low confidential charge of just 0.22 to MCI is taken into account. In Italy rates dropped 80%, while in the Netherlands rates dropped 86%.

- For Rwanda, an agreement with Kenya is used as a backup to the main SKA system; this rate has remained at 5.00 GFC throughout the period. The second backup is a route through Paris where the total charge is the same but FT retains 1.30 for the transit charge.
- For Belgium, rates have remained the same at 1.96 SDRs from 1989 to the present.
- For China, rates have officially not dropped perceptibly, but when the confidential transit charge is taken into account, then rates have dropped from 9.00 GFCs to 8.17 GFCs, a drop of 9%. (1.275 plus 0.12 plus 1.275, times 3.061, equals 8.17 GFCs.) The story is similar in Pakistan, where official rates have not dropped at all from 8.57 GFCs (2.80 SDRs times 3.061 conversion rate equals 8.57 GFCs for 1997), but unofficial, confidential rates have dropped to 7.74, a drop of 10% over the period.

Summarising the main trends discernible from this detailed analysis, it appears that the lead stories are as follows:

- Accounting rates dropped in all high traffic arrangements over the period, sometimes quite substantially (up to 69%).
- Accounting rates dropped in most low traffic arrangements, with some exceptions such as Francophone West Africa and Belgium.
- Transit charges also generally dropped, often substantially, during the period. Confidential transit charges were used in a number of low volume arrangements to lower accounting rates more than was first apparent.
- The usual 50-50 split of termination and origination charges was virtually always retained.

If one assumes that current trends will continue into the future, then it appears that accounting rates for Uganda will continue to fall of their own accord, even absent additional pressure from other parties.

3.3.2 Trends in Non-East African International Traffic

Annex I provides data on the major traffic partners with Uganda for the period 1990 through 1996. The numbers in the exhibit refer to paid minutes. Note that these data do not cover East African partners in the telecommunity of Tanzania, Kenya, Burundi and Rwanda. The only exception to this is a very small amount of traffic to Burundi routed via a satellite backup link, but this amount was so small as to be insignificant and is not shown separately on the exhibit. (This traffic is lumped in with the “other” countries’ traffic. Traffic partners are listed in the order of their traffic volume, as of 1996.

Reviewing the data contained in Annex I, we can discern the following trends:

- The US and UK constituted about 56% of the traffic at the beginning of the period and retained about 54% of the traffic at the end of the period. The US now has somewhat more traffic, while the UK was the leading partner at the beginning of the period.
- Incoming traffic substantially exceeds outgoing traffic for most countries in 1996. However, there are exceptions to this rule, including India, Denmark and Egypt.
- Total incoming traffic was less than outgoing for 1990 and was about equally balanced in 1991. There were exceptions to this trend, however, including the US, where incoming exceeded outgoing in both years. The following countries had greater outgoing than incoming traffic for at least 1990 and 1991: UK, India, Canada, Japan, Italy, France, UAE, Zimbabwe, Austria and Egypt.
- Belgium, which kept accounting rates the same throughout the period, had traffic stay about balanced to 1994, then incoming began to exceed outgoing.

Total traffic grew 125% over the period, but incoming represented the large portion of that growth, both in total and for most traffic partners.

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3.3.3 Price Elasticity of Demand

Price elasticity of demand is the percentage change in quantity demanded divided by the percentage change in price. For Uganda it is possible to make three (widely) varying estimates of price elasticity, as shown in the exhibit below. (Note that these prices are in USD and apply to all outgoing calls to non-East African countries.)

Table 3.4: Changes in international tariffs, 1992, 1994 and 1997

	<i>DATE OF PRICE CHANGE</i>		
	<i>JULY 1, 1992</i>	<i>JULY 1, 1994</i>	<i>SEPT. 1, 1997</i>
Original Price	\$7.50/min USD	\$5.00/min	\$3.00/min
New Price	\$5.00/min	\$3.00/min	\$1.50/min
% Price Change	-33%	-40%	-50%
Period Measured for Volume	July 1, 1990 to June 30, 1992 vs. July 1, 1992 to June 30, 1994	July 1, 1993 to June 30, 1994 vs. July 1, 1994 to June 30, 1995	July & Aug 1997 vs. Sept & Oct 1997
OG Min, Pre Price Change	8,547,993	2,730,224	1,055,168
OG Min, Post Price Change	5,511,818	4,410,694	1,143,751
% Min Volume Change	-36%	+61%	+8%
% Quantity Change/ % Price Change	-36/-33 = 1.09	61%/-40% = -1.53	8/-50 = -0.16

Source: Case Study

Here we see that in July 1992 the price dropped substantially but the volume also dropped, an unexpected result. This may be due to prices being still so high that most consumers continued to use an informal call back system, that other countries dropped their prices more and thus the differential encouraged incoming instead of outgoing calls, and/or due to other exogenous factors not identified. (Two years pre and post data are used here, but the result is about the same if one year of data is used.) One other possible explanation is the poor economy in 1992, when GDP overall dropped to its lowest point in recent years, GNP per capita dropped from \$260 to \$200, there was a spike in inflation to 54.5 percent, and total consumption per capita dropped from \$195 to \$163. All this could have depressed outgoing call volumes.

In July 1994 the price again dropped substantially, but this time volume in the year following the change went up, showing a price elasticity of -1.53, an elastic result in the expected direction.

In September 1997 the price again dropped substantially, but only two months of data after the price change are available. These two months compared with the previous two months show a modest volume increase. However, the price change was only moderately advertised and it is thus unreasonable to expect the volume to change rapidly.

These data are thus rather confusing, showing one major change in the “wrong” direction (in constant dollars, but possibly somewhat in the “right” way in local currency), one modest change in the “right” direction, and one elastic change in the logical direction. In using these elasticity figures we will assume that the elasticity curve is downward, normally curved and elastic, and will use the -1.53 figure in any calculations. (This figure is generally in line with Booz•Allen research in Latin American in 1992-1994, where it was estimated by expert analysis that price elasticities for international long distance ranged from -0.6 for the high income segment of the population to -1.8 for the majority, poorer population.) However, the reader should note that the two other elasticity results for Uganda do cast some doubt on this -1.53 figure.

3.3.4 Telecommunications indicators

Data in relation to the ITU telecommunications indicators is set out in Annex III.

4. COST EVALUATION OF INTERNATIONAL TELECOM SERVICES

UPTC has no cost accounting system that would allow ready analysis of the true cost of network elements, services, and call termination and transmission. However, over the course of the last two years UPTC has participated in a working and study group organised by the PATU.

The PATU group commissioned a study of international calling, focusing on the “average annual costs per circuit, per minute, for telephone and also telex traffic.” The cost method looks at investment costs, annual charges resulting from investment, annual cost of maintenance, annual operating cost, and annual cost of buildings. The study does not look at forward looking or marginal costs, but focuses on current operating costs and capital historic costs, with capital costs distributed over the useful life of the purchase. The study does not distinguish between costs of bringing calls from the border to the international switching centre from ISC costs, but lumps these together. The questionnaire provides little guidance on how to calculate national extension costs, but does require a figure be submitted. Overhead costs are not broken out separately throughout the questionnaire.

The study utilised a questionnaire distributed to Uganda, Kenya, Zimbabwe, Zambia and Ethiopia. The study itself is not obtainable in Uganda, but the Uganda filled in questionnaire is. UPTC staff used this questionnaire and its results in targeting recent international settlement agreements. However, senior management states that much more detailed studies are needed before such data can be usefully employed in negotiating international agreements with other administrations.

Highlights of this questionnaire as completed by UPTC include the following:

- The reference year is 1996; the monetary unit used is the SDR, calculated at GFCs to the SDR and 1 SDR to \$1.20 USD for 1996 (1 SDR to \$1.40 USD for 1997).
- Annual inflation is estimated at 9% since 1992 but telecom sector inflation is estimated at just 6%.
- For the earth station annual amortised costs are estimated at 1.14 million and annual operating costs are estimated at 1.09 million, for a total cost of station of 2.23 million.
- The station has 248 telephony circuits. Remuneration relating to the space segment, annually, per half circuit, is 1.078 million.
- Average construction and installation costs (initial investment) of an international switching centre for each international telephone circuit in use is 25,394. A useful life of 10 years is assumed. Average number of minutes of call traffic handled per year per international telephone circuit in use is 61,258. No summary of international switching costs per minute is given.
- Most interestingly, the cost of the national extension for telephony is estimated at 0.5 per minute. (This was equivalent to \$0.60 USD at the time of doing the study, and was used by UPTC as a target for negotiating recent international settlement agreements.) Unfortunately, no details are available on how this figure was arrived at.

No other cost data appear to be reasonably forthcoming at this time. UPTC senior management desire that a detailed cost study be conducted in the future.

Given the results of this study, UPTC management feel that their international, national and local prices are now roughly in line with costs, although they are eager to make adjustments based on more detailed analyses.

As described, very limited data are available from UPTC on costs. However, it may be possible to derive some indicative costs (in cents, converted from SDRs) per minute for at least the satellite/international gateway/external links portion, using data from the PATU Uganda questionnaire, as follows below. The questionnaire unfortunately does not state what amortization period is used, only that the costs are annualized to one year. Two different numbers for allocable satellite minutes are used, one estimated from the questionnaire and one actual figure from UPTC printouts.

The result is an estimated cost for the satellite links/earth station portion of the costs of about 17 to 21 cents per minute.

Table 4.1: Indicative Analysis of Satellite Links Costs in Uganda

<i>Item (From UPTC)</i>	<i>Period in Years</i>	<i>Cost in USD</i>
Capital Items, Annualized		
Annualized Land Costs	1	\$21,540
Annualized Bldg. Costs	1	505,264
Annualized Equipment Cinteosts	1	1,068,917
Subtotal		\$1,595,721
Operating Costs		
Operating Staff	1	\$962,224
Power, Water & Fuel	1	125,206
Maintenance	1	38,565
Bldg. Maintenance	1	31,440
Space Segment	1	380,264
Subtotal		\$1,537,699
Grand Total Costs		\$3,132,420
# of Circuits		248
Min. per Circuit		61,258
Est. Min (Circ.x Min/Circ)		15,191,984
Cents Per Min (\$Costs/Est. Min)		20.6
1996 Total OG+IC non-EA Minutes		18,350,049
Cents Per Min (\$Costs/1996 Min)		17.1

Source: UPTC

For the international switching element of Uganda’s international services components, which was not separately addressed in the PATU study, an indicatvie cost may be derived by adopting the FCC Tariff Component Price (“TCP”) mechanism. On this basis, a figure of \$0.048 could be used, on the basis that Uganda is a low income country.

As described above, the national extension element has been estimated by Uganda, in its response to the PATU study, as \$0.60. It is not clear how this figure was derived.

The total component cost (taking the lowest estimate of international links) on the basis set out above would yield a figure of \$0.80 approximately.

In seeking to verify these indicative costs (other than by way of comparison with the results achieved in our Lesotho study), we note that Uganda was not included in the FCC TCP work undertaken for the purpose of determining benchmark settlement rates. Two other African countries were considered by the FCC, i.e. Kenya and South Africa, the results of which are set out below.

Table 4.2: FCC TCP estimates for African countries

<i>COUNTRY</i>	<i>International transmission</i>	<i>International switching</i>	<i>National extension</i>
Kenya	\$0.255	\$0.048	\$0.123
South Africa	\$0.052	\$0.034	\$0.083
Uganda	\$10.171	\$0.048	\$0.60

Source: FCC

On this basis, the total cost of the components of an international call in Kenya would be \$0.42 approximately. In South Africa, the total would be \$0.17 approximately.

A comparison with Kenya may be helpful in practice given that both Uganda and Kenya are part of the East African telecommunity. The Uganda total international component price is significantly higher than the total for Kenya, although it would be interesting for comparison purposes to determine what figures Kenya disclosed in the context of the PATU study.

The difficulty in arriving at estimates and in comparing those estimates even to equivalent countries indicates the flaws in both the TCP method and the cost data available to UPTC.

5. SCENARIOS FOR CHANGES IN THE INTERNATIONAL ACCOUNTING SYSTEM

5.1 Revenue Projection Model: Structure

To explore various scenarios involving changes in accounting rates, a revenue projection model was created for Uganda international settlements. This model had the form of an equation, as follows:

$$\Sigma IR_n = [(POC-OG_n) (POGM_n)] + [(PTC_n) (PIM0_n)] + [(UCC_n - UAR_n) (POGM_n)] + [(POGM-EA_n) (CR-EA_n)]$$

Where:

- $\Sigma IR_n =$ International revenue from all sources in year n, summed across all East African and non-East African countries
- $POC-OG_n =$ Projected origination charges for outgoing calls from Uganda in year n (where POC-OG is varied by scenario assumption)
- $POGM_n =$ Projected outgoing minutes from Uganda in year n for non-East African countries (where this is projected by taking volume in the base year (an average of 1995 and 1996 data) times a factor for the price elasticity of the assumed collection charge in Uganda times a factor for line growth in Uganda times a factor for adjusted GDP growth (GDP growth is projected based on recent high averages but adjusted downward somewhat for two factors: population growth, since some of the recent GDP growth is really due to population increases, not GDP per capita); and telecom intensity, since we assume that new, probably poorer, subscribers will not make international calls at quite the same rate as old subscribers)
- $PTC_n =$ Projected incoming termination charges in year n for each non-East African country (projected by scenario assumption)
- $PIM0_n =$ Projected incoming minutes in year n from each non-East African country to Uganda, summed across all countries (projected by taking volume in the base year, an average of 1995 and 1996 data) times an assumed factor for price elasticity of the assumed collection rate in each foreign country times a factor for Uganda line growth times a factor for assumed worldwide GDP growth applicable to all correspondent countries)
- $UCC_n =$ Uganda collection charges for year n for each country destination (assumed to drop at the same rate as the accounting rate drops in each scenario)
- $UAR_n =$ The accounting rate in Uganda related to that country in year n (projected by scenario assumption) (this subtraction of collection rate minus accounting rate yields the surplus of the collection rate over the accounting rate that is retained by UPTC on each call over and above the amount retained by UPTC for originating the call (accounted for above) and the amount paid out to the corresponding country (the terminating charge in the foreign country; generally equal to the originating charge); the subtracted terms are then multiplied by $POGM_n$, the projected outgoing minutes described above)
- $POGM-EA_n =$ Projected outgoing traffic minutes to each East African country (Tanzania, Kenya, Rwanda and Burundi) in year n (projected using estimated current volume in minutes times a factor for line growth in Uganda times a factor for price elasticity in Uganda on the assumed collection rate in Uganda times a factor for quality of service improvement, i.e. reduction in the current call blocking problem)
- $CR-EA_n =$ Collection rate in Uganda to each East African country in year n (assumed by scenario; assuming that the Sender Keeps All to East Africa system remains in place)

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Note that this revenue model ignores possible international revenues in Uganda from second operators or mobile operators, either separately or as they might generate more revenue for UPTC by putting more traffic through UPTC's international gateway or crossborder microwave links. Note too that since this equation has already allowed for outpayments in the UAR_n term, so that a separate term for outpayments is not needed.

5.2 Base Case

Taking the revenue model described above, we can use it to create scenarios of what might happen to UPTC revenues under various conditions.

Taking a base case, we make the following assumptions:

- All forecasts will be through the year 2002. (The only exception is for the FCC scenario which requires actions in 2003. But for all scenarios the year 2002 will be the focus year for comparisons.)
- Line growth in Uganda will be 4 percent per year (this is perhaps rather low given the low number of lines in Uganda, but we wanted a number that would not overwhelm the other effects in the model)
- GDP growth in Uganda will be 9 percent per year, adjusted downward by 2 percent for population and 2 percent for telecom intensity, yielding a net of 5 percent per year (where telecom intensity means that as new, poorer subscribers are added, they will probably not use the telecom services as intensively as existing subscribers)
- Quality of service to non East African countries will increase 2 percent per year and to East African countries will also increase 2 percent per year
- The collection rate and accounting rates in Uganda, other East African countries, and the rest of the world do not change from the present rates
- Worldwide GDP growth is 3 percent per year
- Price elasticity in Uganda is -1.53 applied to the collection rate in Uganda in each year
- Price elasticity elsewhere in the world is -1.1 in high income countries and -1.2 in low income countries, applied to the collection rates in those countries in each year
- Line growth in East African countries outside Uganda is 5 percent per year.

Thus this base case holds prices constant and any changes are driven by network and economic growth, not price changes. Under these assumptions we project that all international revenues rise from \$18.5 M to \$27.8 M in 2002, with East African revenues accounting for \$4.6M and \$8.3 M respectively. This is based on minutes increasing from 5M to 8.5M outgoing from non-East African countries and from 12.7M to 17.8M incoming from non-East African countries, and from 6.7M to 11.3M minutes outgoing to East African countries (incoming minutes from EA countries are not estimated). Thus in the base case, as a result of GDP, line and population growth, all international revenues grow by 50.2% over the 1998-2002 period. Scenarios described later will make comparisons with these base case figures.

Note that this base case partially addresses what would happen under a scenario in which it is assumed that UPTC has justified its current collection charges and accounting rates as cost based (per the PATU study), these charges are accepted by the world community, UPTC keeps its accounting rates where they are, and the current basic accounting rate system does not change through 2002.

A summary table of the results of all the different scenarios is shown at the end of this section.

We also did a simple projection of UPTC turnover by taking historical data and doing a simple CAGR projection forward at 10%. This yielded turnover in 1998 of \$53.8M and in 2002 of \$82.7M. We compare total international revenues to this notional turnover figure for each scenario in the summary table below. Comparing international revenues to these projected UPTC revenues, we see that in the base year international revenues constitute 25.6 percent of total revenue.

For ease of discussion as the model gets more complex, we have changed the order of scenario discussion slightly from the terms of reference.

5.3 Staged reduction in accounting rates

Taking the revenue model and attempting to answer the question of what will happen if there is a staged reduction (and for these purposes we have used 10%, the highest percentage reduction in the range suggested by the ITU) per year as foreseen in ITU-T recommendation D.140, we keep all the above listed assumptions except the following, which are changed:

- Collection rates in Uganda for non-East African countries decline by 10 percent per year
- Accounting rates in Uganda for non-East African countries decline by 10 percent per year; accounting rates for the rest of the world go down the same percentage
- Collection rates in Uganda for “Sender Keeps All” East African countries goes down 10 percent per year.

Under these new assumptions we see that outgoing non-EA minutes rise to 16.3M in 2002; incoming minutes rise to 29.3M; and outgoing EA minutes rise to 21.6M. All these minutes are substantially higher than the minutes in 2002 for the base case.

Total revenues rise to \$29.4M in 2002, with EA revenues amounting to \$9.2M of this total. The total revenue figure is 5.7% higher than the comparable \$27.8M figure for the base case.

To check the validity of these projections, we compared outgoing volume in minutes in the base and out years with minutes per line and minutes per inhabitant published in the literature. The projections were in line with these ratios for less developed countries, although the minutes per line were on the high side, probably because we have kept the line growth rate rather low at 4 percent per year.

Although this scenario provides Uganda with a high revenue outcome, it addresses but does not solve one of the nagging problems of the current settlement arrangements: inflow vs. outflow of traffic. Because collection rates have been higher for some years in Uganda than in many of the developed trading partner countries, outgoing minutes have been much lower than incoming minutes, leading to an outflow of settlement payments to Uganda (and other similar countries) from the US and other developed countries. Under this scenario this situation would change somewhat with incoming as a percent of total (incoming plus outgoing) minutes (for non-EA countries) at 70.1% in 1998 and declining to 64% in 2002. Some trading partners still retain substantial imbalances, however. For example, the US in 1998 has a 88% of its traffic with Uganda as outgoing to Uganda, while by 2002 this situation has improved slightly to 85%, an improvement but still a very substantial imbalance.

To determine the effect of a key variable, Ugandan price elasticity, on these forecasts, we redid the 10 percent decline forecast with Uganda price elasticity set at -1.1 instead of -1.53. Here we found that total revenues were \$26.4M in 2002, 10% less than under the D.140 scenario with a -1.53 elasticity. East African revenue is \$7.7M instead of \$9.2M, driven by outgoing minutes, which declined substantially while incoming expectedly stayed the same.

Importantly, this \$26.4M is less than the base case, thus showing that when prices drop but the elasticity is low, less revenue is generated than if prices are frozen. This highlights the need to have accurate estimates of elasticities in these situations, in order to make informed policy decisions.

5.4 Benchmarking or price caps for settlement rates

The US Federal Communications Commission (“FCC”) has ordered US carriers to negotiate toward termination and origination charges of \$0.23 by January 1, 2003 for less developed countries. This is expected to drive down accounting and collection rates worldwide. To test the effect of this proposed change, we made the following assumptions in the revenue model:

- The termination and origination charge in the base year is \$0.50 for the US, declining each year to \$0.23 in 2003, for a CAGR drop of 12.14 percent.
- For all other countries other than the US, the final year of 2003 is set at a termination and origination charge of \$0.23, and an even CAGR decline from the current charge to the \$0.23 is implemented. This results in a range of declines from 3%/year for Canada to 26% for Belgium, with an average of 15.8% CAGR decline.

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- The worldwide collection rate is also assumed to drop 12.14 percent CAGR, in step with the US-Uganda relation. (Note that this percentage is rather arbitrary.)
- The price elasticity in Uganda is again assumed to be -1.53.

Here the results are that total international revenue grows to \$29.1M, almost as high as the D.140 scenario, and 4.6% higher than the base case. Of this revenue, \$9.2M comes from EA, and the 2002 minutes are 18.5M outgoing from non-EA, 32.4 incoming from non EA, and 24.5 outgoing from EA.

5.5 Call Termination or unbundled interconnection payments

The FCC has also advocated and researched Tariff Component Pricing, (TCP), in which call termination costs are broken into three parts and estimated using different methodologies, then the parts summed into a total for each of various countries. To model this approach for Uganda, we made the following assumptions, which vary from the previous FCC scenario:

- Uganda's system is similar to next door Kenya, for which the FCC estimated a TCP call termination cost of \$ 0.426. (Uganda and Kenya share a similar telecom history, were once part of the same company, are still part of the East Africa telecommunity, have similar technologies, switching hierarchies, pay scales, economies, and competition policies, etc.) Hence this cost is used for Uganda.
- TCP costs for call origination equal costs for call termination for all countries.
- TCP costs for countries which the FCC did not research and estimate can be derived from nearby or adjacent, similar countries with similar economies and levels of development. Thus for example the TCP cost for Norway (unresearched by the FCC) can be derived from the FCC estimate for Sweden of \$ 0.10.
- Each country's settlement rate would decline fairly smoothly from the current rate to the FCC TCP rate.
- The accounting rate system moves immediately to an asymmetric system which is based on the TCP, or on prices moving toward TCP. Thus in 2002 a call from Uganda to Belgium would generate \$0.14 per minute for Belgium, as Belgium's cost-based share for terminating the call. But this same call would yield \$0.43 to Uganda as its cost based share for originating the call. (This call would of course also yield Uganda any excess of the collection rate over the \$0.57 (\$0.43 + \$0.14) accounting rate.) Similarly, a call from Belgium to Uganda would yield \$0.43 to Uganda for terminating the call, and would yield only \$0.14 to the Belgians for originating the call. (The Belgians would retain any excess of the collection rate over the accounting rate.)
- Collection rates still decline at 12 percent per year. This is higher than the average 8 percent that accounting rates are declining under this scenario, but we anticipate that in fact collection rates would drop faster due to competitive pressures (a new second national operator, call-back, Internet telephony, etc.). And using 12 percent keeps this scenario more easily comparable with the previous FCC scenario.
- The price elasticity in Uganda is again assumed to be -1.53.
- The East African SKA system remains unchanged and in place.
- Any improvements in the efficiency of the Uganda phone system, and thus drops in the TCP, are not identified and incorporated into the system until after 2003.

Under this approach the following results are obtained: International revenue grows to \$30.9 million, 11.2 percent higher than the base case and the highest revenue of any scenario. Of this revenue, \$9.2 million still comes from East Africa, and the minutes remain the same as in scenario 5.4 above.

What is occurring here is that the Kenya (and thus Uganda) FCC TCP is rather high, at about 43 cents. This is much higher than the 23 cents FCC benchmark from the previous scenario. And Uganda is reaping the benefit of this higher rate in originating and terminating calls. Hence this scenario is more lucrative. Of course it would be even more lucrative if the PATU 60 cent estimate of call termination costs was used.

5.6 Very low settlement rates, sender keeps all etc.

In this scenario we assume that Uganda and the rest of the world switch to a Sender Keeps All (“SKA”) system in the first and all forecast out years. Thus there is no revenue from termination charges on incoming minutes, and the elements of the equation are reduced to collection charges in Uganda times projected outgoing minutes for non-East African countries and times projected outgoing minutes for East African countries. Here we make the following assumptions (all other assumptions listed earlier stay the same):

- Price elasticity is -1.53
- Collection charges stay the same in Uganda.

Here we find that outgoing minutes to non EA and EA countries unsurprisingly stays the same in 2002 (since in both cases the price remained unchanged). The revenue picture is somewhat different, however, with total revenue in SKA case reaching only \$22.6M, 23% lower than the \$27.8 figure for the base case. East African revenue is the same, as might be expected.

This scenario thus harms Uganda significantly, compared to other scenarios.

To vary this scenario somewhat, we then assume that collection charges in Uganda decline by 10 percent per year. This results in the following: total revenue reaches \$25.3M in 2002, higher than the SKA case with frozen prices, but still 9% lower than the \$27.8M base case figure for 2002. This is true despite the fact that outgoing minutes to non-EA countries is almost double the base case figure, at 16.3M vs. 8.5M for 2002. Similarly, outgoing minutes to EA countries is 21.6M in the SKA (10 percent drop) case and 11.3M in 2002 in the base case.

Thus here the situation has improved somewhat by dropping collection rates and driving up minutes, but Uganda is still definitely worse off than under the base case, where prices are frozen and the current accounting rate system is preserved (at least for non-EA countries).

5.7 Revenue stabilisation measures

The French-speaking regional Tariff Group for Africa (“TAF”) group reached consensus that accounting rates should be cost oriented, that it would take TAF members eight years to be able to institute analytical cost accounting, and that “the revenues of TAF Group members derived from traffic balances must not decline from one year to the next.” They also agreed that the principle of “dissymmetric shares” would apply, meaning that instead of the traditional 50-50 split, a 60-40 or other uneven split might take place. From the exact wording of the TAF report is not clear if “dissymmetric shares” are to take be instituted before 2005. It is also unclear if TAF wishes that “tariff balances must not decline” from year to year, as stated, or if the principle of the “possible formula” would apply, which focuses on a “minimum annual acceptable growth rate.” This latter would seem to be a quite different thing. The TAF prescription thus is rather hard to test, but our best approximation is to make the following assumptions:

- In each year, the total accounting rate (termination plus origination charge) must decline 10 percent, as in the D.140 scenario. (Under our base and other scenarios, where revenues grow naturally as a result of GDP, line and other factors, there would probably be no TAF adjustment needed in any year for any country if we took TAF literally at “tariff balances must not decline,” since all revenues go up in each year. Hence this would not be a fruitful avenue to explore.)
- The Uganda and all other collection rates are also assumed to decline 10 percent per year.
- It is assumed that the “minimum acceptable growth rate” for Uganda is 10 percent per year, and that this rate applies to Uganda’s relations with all developed countries.
- It is assumed that this percent is applied to the percentage growth in total (origination plus termination) revenue derived from each relation with each developed country; that if this percentage is less than 10 percent, then the termination and origination charges are adjusted until the revenue amount dictated by the 10 percent growth goal is achieved. The new adjusted revenue amount is then divided by the total (outgoing plus incoming) minutes for each country relation, and a new origination and termination charge for each country is calculated which yields the new adjusted revenue amount. The actual

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accounting rate (under the 10 percent per year decline requirement) is then compared to the new termination and origination rates, and a new percentage split (non 50-50) is calculated. If the percentage growth is more than 10 percent, then no adjustment in the accounting rate split is made. Less developed countries and “other” countries are ignored and not adjusted from the D.140 scenario. (We expect it is unlikely that any dissymmetric subsidies would be forthcoming from other underdeveloped countries to Uganda.)

- In the next year, the previous year’s uneven split, if any, is ignored, and the model tries to reset the accounting rate with a 50-50 split, unless there is another need to reset the split.
- The price elasticity is still assumed to be -1.53.

Under these assumptions the results are the highest total revenue of any scenario, at \$30.4M, with \$9.2M of that coming from EA. This figure of \$30.4M is 9.3 percent higher than the base case and is \$1M higher than the next highest scenario, the D.140, 10 percent decline scenario. This higher figure is not surprising since basically a new source of revenue--subsidy from dissymmetric shares--has been tapped.

The countries which contribute this subsidy include the US, UK, Canada, Sweden, France, Netherlands, Norway, Japan, Austria and Germany. The highest dissymmetric share is 57% in 2002 for the US, followed by Canada at 56%, Sweden at 55%, and the UK at 53%. Note that in years before 2002 the percentages are lower and closer to 50%. Various other developed countries, such as Belgium, Denmark and Italy grew at more than 10% per year and hence no dissymmetric share adjustment was needed.

5.8 Uganda Drops Collection Rates Faster

To explore the question of incoming vs. outgoing flows of accounting payments, we undertook a variation of the D.140 scenario described earlier. Here we made the following assumptions:

- The price elasticity is still assumed to be -1.53.
- Uganda drops its collection rate faster than all other countries, with a 15% drop per year (applied to the previous year’s rate) for Uganda **for the first three years followed by a 10% drop for the last two years**; and a 10% drop per year for all other countries including East African countries.
- Uganda and all other countries drop their accounting rates at a uniform 10% per year.

All other base case assumptions remain the same.

One might desire scenarios with greater drops in the collection rate (such as 15 or 20% each year for all years) while the accounting rates (termination plus origination charge) dropped 10% per year. We examined some of these and found that the collection rate then rapidly dropped below the accounting rate, a situation which can exist (as we found in Lesotho) but which is unlikely to happen if the future is carefully planned for and the current situation monitored. Hence we scrapped these scenarios. Under this scenario the collection rate generally ends the period slightly above the accounting rate, such that Uganda does collect a small surplus beyond what it keeps as an origination fee.

This scenario attempts to achieve what the FCC apparently wants: lower accounting rates, lower collection rates, and more balanced flows of minutes and revenue. Here we see that the results for Uganda are not bad, with total revenues fairly high at \$28.2M.

The goals of equalising revenue and minutes are partly achieved. In this scenario in 1998 the incoming (non-EA) minutes as a percent of all (non-EA) minutes is 69 percent. This is reduced in this scenario to 60 percent. There is a similar trend in individual country relations, also. For example, the percent of total minutes for the US-Uganda drops from 87 percent incoming to Uganda in 1998 to 82 percent in 2002; from 69 to 60 percent for the UK; and from 83 to 77 percent for Canada.

In revenue terms, these major trading partners get slightly closer to the equality they desire: for the US, inpayments to UPTC minus outpayments to the US (AT&T+MCI) changes from \$2.2M minus \$0.3M, for an excess of \$1.9M in 1998, to \$2.8M minus \$0.6M, for an excess of \$2.2M in 2002. Thus the excess went up but the outpayments to the US did double. The similar figures for the UK are \$2.5M minus \$1.1M for an excess of \$1.4M in 1998 changing to \$3.2M minus \$2.1M for an excess of \$1.1M in 2002; and for Canada

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the figures are \$173K minus \$34K for an excess of \$139K in 1998 changing to \$220K minus \$64K in 2002 for an excess of \$156K in 2002.

Thus it appears that this scenario achieves higher revenues for Uganda, with modest gains toward improving the balance of traffic and inpayments vs. outpayments.

5.9 Summary of revenue projection results

We can summarise the various scenarios described above with the following table. This shows the base case projection for 1998 and 2002, and for 2002 other projections for each scenario. The most important row is probably the top row, which shows that Uganda is best off under the TAF and FCC TCP scenario, with the D.140 and FCC benchmark scenarios in second place (all assuming an elasticity of -1.53) and worst off under the SKA scenario with no drop in prices.

The last row of the table shows the percentage that all international revenues (incoming and outgoing, including surplus above the accounting rate received from the collection rates) from all countries account for, as a percentage of the total estimated UPTC revenues for that year. (This latter estimated by a simple 10% CAGR on non-international revenues to arrive at \$82.7M in 2002, then adding in estimated international revenues from this table.) Here we see that international revenues start the period in the base case at 25.6%, and stay in that general range in the year 2002, with a spread from 27.2% in the FCC TCP scenario down to 21.4% in the SKA zero price drop scenario.

Table 5.9: Revenue & minutes under various scenarios

	<i>Base Case 1998</i>	<i>Base Case 2002</i>	<i>D140 -10% 2002</i>	<i>D140 -10% & -1.1 Elast. 2002</i>	<i>FCC \$0.23; 2002</i>	<i>FCC TCP \$426 2002</i>	<i>SKA -0% 2002</i>	<i>SKA -10% 2002</i>	<i>TAF 2002</i>	<i>D140U g Coll. Rate -15% -10% 2002</i>
All Int Rev.M\$	18.5	27.8	29.4	26.4	29.1	30.9	22.6	25.3	30.4	28.2
EA Rev.M\$	4.6	8.3	9.2	7.7	9.2	9.2	8.3	9.2	9.2	9.2
MinOG NonEA	5.6	8.5	16.3	13.7	18.5	18.5	8.5	16.3	16.3	19.4
MinIC NonEA	13.6	17.8	29.3	29.2	32.4	32.4	29.3	29.2	29.3	29.3
MinOG EA	7.5	11.3	21.6	18.2	24.5	24.5	11.3	21.6	21.6	25.8
Int.Revas % of est All Rev	25.6	25.1	26.2	24.2	26.0	27.2	21.4	23.4	26.9	25.4

Source: Case Study

6. CONCLUSIONS

6.1 Evaluation of scenarios based on the revenue projection models

We do not believe that the TAF scenario of changing the 50-50 split of accounting rates is realistic as, on the basis of the model outlined above, it indicates that a further source of revenue is effectively derived from UPT's correspondents. Given the international climate with regard to international settlement balances, correspondents are unlikely to be swayed by arguments that such a system is necessary on the basis that it represents a disproportionate response. We think that this is especially true when the argument revolves around "a reasonable increase in revenue" as is the case here, rather than a decrease in actual revenues. However, it may be possible to envisage alternative "commercial" responses such as the provision of equipment on favourable terms in return for a negotiated reduction in the accounting rate. This would represent a one-off package rather than an ongoing commitment to subsidise national network development.

If that scenario is omitted, then Uganda is best off with the D140 scenario, in which collection rates and accounting rates drop at 10 per cent per year for five years. This scenario is also attractive to the US and others in that it results in lower accounting and collection charges in a reasonably rapid manner. This would then seem to be the best scenario from a political compromise and realism point of view.

This scenario assumes, in our revenue projections, a drop in collection rates of 10% per year, a not unrealistic assumption given UPTC's sensitivity to the threat of call-back. It is difficult to estimate the likely decline in this threat. Section 3.2.1 referred to the recent 50% drop in collection rates, in which loss of revenue to call-back was a factor. UPTC anticipates that after this drop in rates, loss of revenue will decline on a monthly basis by 50%.

6.1.1 Likely commercial responses

UPTC is sensitive to international trends and to factors, such as call-back, which to a large extent governed its decision to drop collection rates significantly in September 1997. In addition, as section 3.3.1 describes, accounting rates have been declining in recent years on relations with major correspondents. However, UPTC derives approximately 6% of its turnover from international settlement revenues. Although UPTC relies on settlement revenues partially to fund its network build out, it is likely that UPTC will be equally sensitive to changes in the accounting rate regime, seeking to manage change in the manner best calculated to maximise its settlement revenues for as long a time as possible.

One possible UPTC response would be to lower collection rates sufficiently to warrant reverse call-back operators operating, at least within the East African telecommunity. It is unlikely that call-back operators would be incentivised to offer reverse call-back from countries such as the US and the UK. However, call-back will cease to be the most pressing competitive concern of UPTC/UTL as direct facilities competition will become a reality when the MTN/Telia consortium receives its second national operator licence. Other options for international services may become available with the licensing of value added and data services. An instant move to a world served by personal computers and software enabled Internet voice telephony is unlikely but proposals for call centres may address the issue of communications generally, bringing Internet access to remote or unserved regions. The provision of alternative international facilities, in the short to medium term, may free up capacity for alternative services such as throughout Internet telephony and other options, such as least cost routing, may be explored.

Another possible response would be to take up suggestions of acting as an East African hub, thus breaking the East African telecommunity informal code of conduct. UPTC has set itself against this option but it may occur without the active participation by UPTC if accounting rates and conveyance charges fall. It will be interesting to see whether the MTN/Telia consortium are constrained in any way by the informal telecommunity arrangements. If not, one interesting effect of competition may be the development of the second national network and its gateway as a hub for East Africa. With competition in domestic services developing, efficiency gains and improved cost-allocation and accounting may bring costs and collection rates down, attracting hubbing opportunities.

An alternative source of external financing for UPTC will be derived from the sale of a stake in the newly corporatised UTL. In addition, the licensing of the second national operator will act as a spur to UPTC to continue to lower collection rates in order to avoid losing customers. Both licensees will be subject to build

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obligations and access requirements, subject to the developing level of network penetration. Competition itself will act favourably on the incentives to meet these obligations.

UPTC will in any event be facing competition from the second national operator, when the second operating licence is granted. The second national operator, the MTN/Telia consortium, will be authorised to provide international services. Correspondent agreements must be notified to the Commission, who may require that its prior approval is required before these arrangements can be concluded. It is understood that the interim staff at the Commission have just concluded licence negotiations with MTN/Telia.

Looking forward, the operator investing in UTL or a member of the operator's corporate group may be authorised to provide international services in their own jurisdictions. Certainty, Telia is authorised to provide international services in Sweden and in some other jurisdictions. Thus, the concept of end-to-end service provision may become a reality, although it is likely that the Commission will look to see arms-length transactions for the conveyance and termination of international calls.

6.1.2 Likely policy response

Uganda is at present negotiating its commitments in relation to basic telecommunications under the GATS, part of which will consist in the adoption by Uganda of the Reference Paper.

Much of the "regulation" of international services will derive from regulations promulgated by the Commission. It will be interesting to see how the Commission manages the duopoly of UPT, as it will be, and the second national operator in relation to international services. In some jurisdictions, parallel accounting requirements were adopted, which required operators authorised to provide international services based on the same accounting rate levels. These requirements were designed to prevent monopoly foreign operators from playing the duopoly providers off against each other. In practice, parallel accounting had the effect of maintaining artificially high accounting rates. However, given the importance of settlement rate revenues to the build out of the domestic networks, some form of protection may be envisaged.

This may make a staged reduction in accounting rates the more likely option as it is more easily managed by the regulatory authority. The Commission will need to balance increased investment capital flowing from the strategic investment in UTL and the presumed operating capital of the second national operator in terms of funding network development against a possible decline in settlement revenues.

In seeking to manage the move to a duopoly and an otherwise liberalised market, the Commission will need carefully to balance the environment for maximising investment in domestic infrastructure against the market disciplines expected of newly liberalised entities and the increasing competitiveness of international services, both within Uganda and outside.

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ANNEX I - INTERNATIONAL TRAFFIC PATTERNS

Year	1990		1991		1992		1993		1994		1995		1996		1996	1996
Incoming or Outgoing	IC	OG	IC	OG	IC	OG	IC	OG	IC	OG	IC	OG	IC	OG	IC & OG	Percent of Total
USA (MCI & AT&T)	867,364	565,166	879,426	415,132	1,231,914	461,741	1,707,294	327,857	2,750,391	447,456	3,731,765	539,237	4,612,213	541,639	5,153,852	28.1
UK (BTI & MCL)	1,312,893	1,796,666	1,505,233	1,674,068	1,887,634	1,100,166	2,151,151	851,575	3,287,757	938,216	3,653,430	1,276,434	3,124,369	1,414,027	4,538,396	24.7
India	4,941	180,541	33,093	160,272	101,880	142,354	52,750	132,981	306,787	263,944	354,330	538,159	351,922	684,571	1,036,493	5.6
S. Africa	11,587	21,442	74,540	43,373	99,203	33,728	139,011	45,162	397,765	101,091	525,164	191,243	585,543	313,721	899,264	4.9
Canada	98,587	321,191	127,682	165,368	231,478	131,103	268,643	65,153	331,264	55,922	475,066	81,676	689,841	121,773	811,614	4.4
Japan	31,613	78,196	42,709	62,752	62,310	78,361	107,557	64,878	195,280	85,414	470,934	147,980	576,947	121,597	698,544	3.8
Germany	209,206	172,381	213,376	177,625	209,968	127,680	455,402	110,348	462,200	154,796	456,340	168,666	472,829	206,778	679,607	3.7
Italy	79,935	153,060	96,974	163,012	96,147	118,259	130,326	103,301	189,490	129,631	129,459	148,320	234,985	165,718	400,703	2.2
UAE	91,718	175,686	89,743	124,980	58,085	58,136	71,536	65,069	161,613	95,050	231,982	140,267	263,382	135,941	399,323	2.2
Switzerland	99,654	65,803	116,518	84,894	137,710	74,587	159,595	75,172	233,163	109,171	226,799	113,293	228,644	132,722	361,366	2.0
France	44,573	89,449	77,837	96,685	77,326	56,796	95,898	55,366	151,070	85,493	177,505	119,127	215,514	142,869	358,383	2.0
Netherlands	47,349	38,116	69,937	47,354	67,546	49,387	82,782	43,681	111,315	60,513	150,377	88,263	163,690	101,230	264,920	1.4
Belgium	61,262	61,169	74,017	92,386	69,086	53,327	71,221	53,678	120,692	78,217	115,564	99,190	142,598	118,873	261,571	1.4
Sweden	135,947	94,837	146,413	80,538	176,392	57,292	154,370	49,319	192,630	47,483	210,515	61,030	195,152	56,825	251,977	1.3
Denmark	74,624	55,847	97,825	76,367	118,525	75,984	141,364	63,656	201,171	74,635	73,698	110,588	92,043	137,054	229,097	1.2
Zimbabwe	18,886	21,745	23,096	29,839	14,616	24,063	29,203	19,144	60,719	42,522	88,694	52,360	86,726	57,379	144,105	0.8
Egypt	15,272	16,361	22,885	44,804	23,224	46,549	27,949	22,991	46,893	34,736	60,603	61,446	64,740	74,011	138,751	0.7
Norway	16,930	17,552	23,188	18,165	40,134	23,934	47,577	18,623	57,377	17,617	66,573	22,780	93,975	30,939	124,914	0.7
Algeria	3,348	2,243	3,574	5,663	3,022	1,638	985	404	883	350	2,697	486	102,791	1,278	104,069	0.6
Austria	11,239	12,877	20,215	21,064	25,268	15,506	31,181	16,146	55,617	22,627	65,465	25,799	70,051	28,511	98,562	0.5
Other	471,593	539,356	450,540	609,057	566,800	546,657	774,850	481,692	990,506	682,609	1,055,708	870,306	721,862	672,776	1,394,538	7.8
TOTAL	3,708,521	4,479,684	4,188,821	4,193,398	5,298,268	3,277,248	6,700,645	2,666,196	10,304,583	3,527,493	12,322,668	4,856,650	13,089,817	5,260,232	18,350,049	

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ANNEX II - ACCOUNTING RATE EXHIBIT

Year	Country	Total Accounting Rate	Currency	Traffic Type (Both Ways, Incoming, Outgoing)	Cascade or Direct Accounting	Origin Retains	Confidential Transit Charge	Official Transit Charge	Transiting Administration	Destination Charge	Tariff Effective Date	Agreement Used for Major Traffic or as Backup
1992-3	USA (AT&T)	1.50	USD	NA	NA	0.75	-	0	Direct	0.75	1/6/92	MT
1995	USA (AT&T)	1.50	USD	BW	CA	0.75	-	0	Direct	0.75	1/1/88	MT
1995	USA (MCI)	1.50	USD	BW	CA	0.75	-	0	Direct	0.75	1/1/93	MT
1996/7	USA (AT&T)	1.00	USD	BW	DA	0.50	-	0	Direct	0.50	1/1/97	MT
1996/7	USA (MCI)	1.20	USD	BW	DA	0.325	0	0.55	BTI	0.325	1/4/96	BU
1996/7	USA (Sprint)	1.00	USD	IC	CA	0.265	0	0.47	Rome	0.265	1/1/97	MT
1997	USA (AT&T)	1.00	USD	BW	DA	0.500	0	0	Direct	0.500	1/1/97	MT
1992/3	UK (BT)	1.20	SDR	NA	NA	0.60	-	0	Direct	0.600	1/1/82	MT
1995	UK (BTI)	1.40	SDR	BW	DA	0.70	-	0	Direct	0.700	1/1/95	MT
1996	UK (BTI)	1.20	SDR	BW	DA	0.60	-	0	Direct	0.600	1/4/96	MT
1997	UK (BTI)	1.00	SDR	BW	DA	0.50	-	0	Direct	0.500	1/7/97	MT
1992/3	Canada	1.00	SDR	NA	NA	0.29	-	0.42	Germany	0.29	1/4/90	MT
1995	Canada	0.700	SDR	BW	CA	0.35	-	0	Direct	0.35	NA	MT
1996	Canada	0.700	SDR	BW	DA	0.35	-	0	Direct	0.35	1/9/96	MT
1997	Canada	0.400	SDR	BW	DA	0.20	-	0	Direct	0.20	1/9/97	MT
1992/3	India	1.66	SDR	NA	NA	0.62	-	0.42	Kenya	0.62	1/10/89	MT
1995	India	1.66	SDR	BW	CA	0.65	-	0.36	Germany	0.65	1/6/93	MT
1996/7	India	1.28	SDR	BW	CA	0.55	-	0.18	Startec	0.55	1/4/96	MT
1992/3	S. Africa	1.96	SDR	NA	NA	0.78	-	0.40	Germany	0.78	1/7/91	MT
1995	S. Africa	1.96	SDR	BW	DA	0.80	-	0.36	AT&T	0.80	1/2/93	MT

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Year	Country	Total Accounting Rate	Currency	Traffic Type (Both Ways, Incoming, Outgoing)	Cascade or Direct Accounting	Origin Retains	Confidential Transit Charge	Official Transit Charge	Transiting Administration	Destination Charge	Tariff Effective Date	Agreement Used for Major Traffic or as Backup
1996	S. Africa	1.20	SDR	BW	DA	0.60	–	0	S. Africa	0.60	1/12/96	MT
1997	S. Africa	1.00	SDR	BW	DA	0.50	–	0	S. Africa	0.50	1/4/97	MT
1992/3	Japan	1.60	SDR	NA	NA	0.59	–	0.42	Kenya	0.59	1/1/91	MT
1995	Japan	1.60	SDR	BW	CA	0.635	–	0.33	Tanzania	0.635	1/9/91	MT
1996	Japan	1.30	SDR	BW	CA	0.455	0.290	0.390	Rome	0.455	1/4/96	MT
1997	Japan	1.30	SDR	BW	CA	0.455	0.120	0.390	Rome	0.455	1/1/97	MT
1992/3	Germany	1.96	SDR	OG	DA	0.62	–	0.36	AT&T	0.98	1/2/93	MT
1995/6	Germany	1.40	SDR	BW	DA	0.70	–	0	Direct	0.70	1/4/95	MT
1997	Germany	1.00	SDR	BW	DA	0.50	–	0	Direct	0.50	1/1/97	MT
1998	Germany	0.60	SDR	BW	DA	0.30	–	0	Direct	0.30	1/1/98	MT
1992/3	France	1.96	SDR	NA	NA	0.78	–	0.40	AT&T	0.78	1/7/91	MT
1995/6	France	1.96	SDR	BW	DA	0.98	–	0	Direct	0.98	NA	MT
1997	France	1.00	SDR	BW	DA	0.50	–	0	Direct	0.50	1/4/97	MT
1992-97	Lesotho	1.36	SDR	NA	NA	0.45	–	0.46	BTI	0.45	1/3/89	MT
1995	Lesotho	1.36	SDR	BW	CA	0.53	0.29	0.35	MCI	0.505	1/9/95	BU
1996/7	Lesotho	1.36	SDR	BW	CA	0.505	0.22	0.35	MCI	0.505	1/9/96	BU
1992/3 1995/7	Mauretania	9.00	GFC	BW	CA	3.85	–	1.30	France	3.85	1/3/88	MT
1996	Mauretania	2.940	SDR	BW	CA	1.325	0.29	0.35	MCI	1.295	1/9/95	BU
1997	Mauretania	2.940	SDR	BW	CA	1.295	0.22	0.35	MCI	1.295	1/9/96	BU
1992/3 1995	Bahamas	3.55	USD	BW	CA	1.535	–	0.48	AT&T	1.535	1/1/91	MT
1996/7	Bahamas	3.55	USD	BW	CA	1.535	0.24	0.48	AT&T	1.535	1/1/91	MT

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Year	Country	Total Accounting Rate	Currency	Traffic Type (Both Ways, Incoming, Outgoing)	Cascade or Direct Accounting	Origin Retains	Confidential Transit Charge	Official Transit Charge	Transiting Administration	Destination Charge	Tariff Effective Date	Agreement Used for Major Traffic or as Backup
1997	Bahamas	1.94	SDR	BW	CA	0.795	0.22	0.35	MCI	0.795	1/1/96	BU
1992/3	Sri Lanka	2.70	SDR	NA	NA	1.13	–	0.44	BTI	1.13	1/6/89	MT
1995	Sri Lanka	1.66	SDR	BW	CA	0.635	–	0.39	Rome	0.635	1/1/92	MT
1996	Sri Lanka	1.66	SDR	BW	CA	0.685	0.29	0.35	MCI	0.655	1/9/95	MT
1997	Sri Lanka	1.66	SDR	BW	CA	0.655	0.29	0.35	MCI	0.655	1/9/96	MT
1992/3	Zimbabwe	1.96	SDR	NA	NA	0.77	–	0.42	BTI	0.77	1/2/92	MT
1995	Zimbabwe	1.97	USD	BW	CA	0.77	–	0.43	AT&T	0.77	1/7/94	MT
1997	Zimbabwe	1.97	USD	BW	CA	0.77	0.24	0.43	AT&T	0.77	1/7/94	MT
1992/3	Colombia	4.00	USD	NA	NA	1.735	–	0.53	AT&T	1.735	1/1/91	MT
1995/6	Colombia	2.28	SDR	BW	CA	0.930	–	0.42	BTI	0.930	1/8/93	MT
1997	Colombia	2.00	SDR	IC	CA	0.805	0.120	0.390	Rome	0.805	1/9/97	MT
1992/3	Switz/Liech.	2.60	SDR	NA	DA	1.30	–	0	Direct	1.30	1/7/90	MT
1995	Switz/Liech.	1.40	SDR	BW	DA	0.70	–	0	Direct	0.70	1/10/95	MT
1996	Switz/Liech.	1.20	SDR	BW	DA	0.60	–	0	Direct	0.60	1/1/96	MT
1997	Switz/Liech.	1.00	SDR	BW	DA	0.50	–	0	Direct	0.50	1/1/96	MT
1992/3	UAE	6.43	GFC	NA	NA	2.605	–	1.22	AT&T	2.605	1/1/91	MT
1995	UAE	6.43	GFC	BW	CA	3.215	–	0	BTI	3.215	1/5/93	MT
1996	UAE	2.10	SDR	BW	CA	0.905	0.290	0.35	MCI	0.875	1/9/95	MT
1997	UAE	3.061	GFC	BW	CA	1.0306	0.670	1.00	MCI	1.0305	1/1/97	MT
1998	UAE	1.840	GFC	BW	CA	0.420	0.670	1.00	MCI	0.42	1/7/98	MT
1992/3	Italy	2.48	SDR	NA	NA	0.82	–	0.42	Direct	1.24	1/9/90	MT
1995	Italy	1.60	SDR	BW	DA	0.80	–	0	Direct	0.80	1/1/93	MT

UGANDA

Year	Country	Total Accounting Rate	Currency	Traffic Type (Both Ways, Incoming, Outgoing)	Cascade or Direct Accounting	Origin Retains	Confidential Transit Charge	Official Transit Charge	Transiting Administration	Destination Charge	Tariff Effective Date	Agreement Used for Major Traffic or as Backup
1996	Italy	1.40	SDR	BW	DA	0.70	–	0	Direct	0.70	1/1/92	MT
1997	Italy	0.50	SDR	BW	DA	0.25	–	0	Direct	0.25	1/4/97	MT
1992/3	Sweden	6.00	GFC	NA	NA	3.00	–	0	CPN	3.00	1/1/85	MT
1995	Sweden	4.90	GFC	BW	DA	2.45	–	0	COPEN	2.45	1/4/93	MT
1996	Sweden	1.60	SDR	BW	DA	0.98	–	0	TEL2SWD	0.98	1/10/95	MT
1997	Sweden	1.00	SDR	BW	DA	0.50	–	0	TEL2SWD	0.50	1/1/97	MT
1992/3	Netherlands	2.94	SDR	NA	DA	1.47	–	0	Direct	1.47	1/4/82	MT
1995	Netherlands	1.40	SDR	BW	DA	0.70	–	0	Direct	0.70	1/10/95	MT
1996	Netherlands	1.00	SDR	BW	DA	0.50	–	0	Direct	0.50	1/6/96	MT
1997	Netherlands	0.40	SDR	OG	DA	0.04	0.22	0.36	AT&T	0.04	1/10/97	MT
1992-95	Denmark	1.96	SDR	NA	NA	0.98	–	0	Direct	0.98	1/2/89	MT
1996	Denmark	1.60	SDR	BW	DA	0.70	0.20	0.0	TEL2SWD	0.70	1/1/96	MT
1997	Denmark	1.60	SDR	BW	DA	0.62	0.20	0.36	AT&T	0.62	1/2/93	MT
1992-97	Rwanda	5.00	GFC	NA	NA	2.50	–	0	Kenya	2.50	1/5/87	BU
1997	Rwanda	5.00	GFC	BW	SKA	1.85	–	1.30	Paris	1.85	1/3/87	2nd BA
1992-99	Belgium	1.96	SDR	NA	NA	0.98	–	0	Direct	0.98	1/5/89	MT
1992/3 1995	China	9.00	GFC	NA	NA	3.89	–	1.22	AT&T	3.89	1/1/91	MT
1996	China	9.00	GFC	BW	CA	3.90	0.90	1.20	Rome	3.90	1/1/96	MT
1997	China	2.94	SDR	BA	CA	1.275	0.12	0.39	Rome	1.275	1/1/97	MT
1992/3 1995	Egypt	6.40	GFC	NA	NA	2.60	–	1.20	Rome	2.60	1/1/93	MT
1996	Egypt	6.40	GFC	BW	CA	2.60	0.90	1.20	Rome	2.60	1/1/96	MT

UGANDA

Year	Country	Total Accounting Rate	Currency	Traffic Type (Both Ways, Incoming, Outgoing)	Cascade or Direct Accounting	Origin Retains	Confidential Transit Charge	Official Transit Charge	Transiting Administration	Destination Charge	Tariff Effective Date	Agreement Used for Major Traffic or as Backup
1997	Egypt	4.00	GFC	BA	CA	1.40	0.36	1.20	Rome	1.40	1/7/97	MT
1992/3	Pakistan	8.57	GFC	NA	NA	3.635	–	1.30	Germany	3.635	1/4/90	MT
1995	Pakistan	8.57	GFC	SW	CA	2.685	–	1.20	Rome	3.685	1/1/93	MT
1996	Pakistan	8.57	GFC	BW	CA	3.685	0.90	1.20	Rome	3.685	1/1/96	MT
1997	Pakistan	2.80	SDR	BW	CA	1.205	0.12	0.39	Rome	1.205	1/1/97	MT

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ANNEX III - TELECOMMUNICATIONS INDICATORS

UGANDA		UGA						
Year Ending 30.06.		Local Currency: Shilling						
Item	Unit	1992	1993	1994	1995	1996	1997	
323m	Total telex traffic (minutes)	10x3						
STAFF								
151	Full-time telecommunication staff	10x3	1.25	1.25	1.22	1.32	1.35	
QUALITY OF SERVICE								
1141	Faults cleared by next day	%	14.90	10.60	58.00		36.00	
1142	Unsuccessful local calls	%	55.20	67.50	49.90			
11421	Unsuccessful local calls due to busy no.	%			24.80			
11422	Unsuccessful calls due to no answer				23.10			
11423	Unsuccessful calls due to technical				2.00			
1143	Faults per 100 main loss per year	%		380.00	100.00	80.00	90.00	
1144	Operator assistance calls answered	%			64.00			
TARRIFS (LOCAL CURRENCY)								
1151	Residential tph connection fee		21,250.00	21,250.00	125,000.00	138,000.00	138,000.00	170,000.00
1151b	Business tph connection fee		21,250.00	21,250.00	125,000.00	138,000.00	138,000.00	170,000.00
1151c	Analog cellular connection charge		0.00	0.00	0.00	0.00		
1151d	Digital cellular connection charge		0.00	0.00	0.00			
1152	Residential monthly subscription		800.00	800.00	1,500.00	6,000.00	6,000.00	19,000.00
1152b	Business monthly subscription		800.00	800.00	1,500.00	6,000.00	6,000.00	19,000.00

UGANDA

		UGANDA		UGA				
Year Ending 30.06.		Local Currency: Shilling						
1153	Cost of a 3 minute local call (peak rate)		50.00	50.00	50.00	200.00	200.00	
1153b	Cost of a 3 minute local call (peak rate)	US\$	0.04	0.04	0.05	0.21	0.19	
1153c	Analog call - cost 3-min local call		0.00	0.00	0.00	0.00		
1153	Analog call - cost 3-min local call					0.00		
1153d	Digital call - cost 3-min local call		0.00	0.00	0.00			
1153	Digital cellular - cost 3 min local call							
1153do	Cost of a 3-min local call (off-peak)							
REVENUE AND EXPENSE								
171	Telephone income	10x5	31,477.79	31,492.44	37,151.99	43,883.00	43,940.06	35,757.03
171331	- Outpayments to foreign administrations	10x5			3,613.88	5,328.28	5,754.35	6,100.75
172	Income from telegraphs	10x5	69.72	393.76	84.47	75.43	57.04	59.75
173	Income from telex	10x5	1,585.96	883.34	2,036.76	1,798.81	1,397.04	616.30
1731	Income from data transmission	10x5						
1732	Leased circuit revenue	10x5					592.23	2,403.13
174	Other income	10x5	262.59				2,884.65	3,370.94
1741	Mobile communication revenue	10x5						
175	Telecom service revenue	10x5	33,396.06	32,768.54	40,683.19	47,752.16	45,394.00	48,307.90
176	Total expense for telecom services	10x5	13,579.35	19,740.59	13,918.78		55,154.49	
1761	Operational expenditure	10x5	7,480.18	14,248.68	11,432.07			7,969.50
17611	Wages and other personnel expenditure	10x5					16,361.43	19,787.05

UGANDA

		UGANDA	UGA					
Year Ending 30.06.			Local Currency: Shilling					
1762	Depreciation	10x5	958.67	1,035.40	1,205.83	5,123.03	5,304.44	8,439.71
1763	Net interest paid/received	10x5	1,587.30	1,690.33	1,280.88			
17631	Interest paid	10x5				4,583.63		4,998.97
17632	Interest received	10x5					64,340	10.92
1764	Income tax	10x5	3,143.99	1,970.49	7,493.14	2,050.88		
177	Profit/loss	10x5				41,936.57	6,105.14	(44,422.26)
CAPITAL EXPENDITURE								
181	Annual investment in telecom	10x5	14,239.47	11,825.93	9,243.28	22,429.50	20,432.36	
BALANCE SHEET								
185	Total fixed assets	10x5	9,776.65	11,942.65	12,671.08		11,875.94	
1851	Equity	10x5	3,786.95	7,251.86	49,074.21		7,181.20	9,308.00
1852	Long-term debt	10x5	61,269.96	71,123.84	64,940.42		71,665.35	95,229.51
1853	Other liabilities	10x5	53,583.80	50,689.41	67,842.87		76,603.50	
BROADCASTING								
1955	Radio receivers	10x3	2,100.00	2,200.00	2,300.00	2,400.00	2,500.00	
1965	Television receivers		300,000.00	350,000.00	400,000.00	500,000.00	525,000.00	
INFORMATION TECHNOLOGY								
14211	Internet host computers	10x3	0.00	0.00	0.00	0.06	0.02	
14212	Estimated Internet users	10x3				10.00	10.50	

Sections 7, 8 and 9 are in millions of local currency at current prices