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Case study of the impact of the changing international telecommunications environment on Sri Lanka¹

A study by Antelope Consulting for the Commonwealth Telecommunications Organisation, the World Bank *InfoDev*, and the International Telecommunication Union

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Conventions

The following conventions are adopted in this report:

- estimated figures are in italics
- boxes that should contain missing or unavailable figures are left blank
- - means non-zero but smaller than half of the smallest unit shown in similar boxes
- for sums of money relating to 1997 or later dates, the conversion rate of 60 Rs to US\$1.00 is used (and 0.69 SDR to US\$1.00)

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1. GENERAL SITUATION OF SRI LANKA

1.1 The Sri Lankan people and economy

Sri Lanka is an independent democratic island nation of some 19 million people, relatively densely populated at 280 people per square kilometre. Its area of 65,000 sq km is similar to that of Ireland. It is situated in the Indian Ocean near the southernmost tip of India. The majority of the population is Sinhalese, predominantly of Buddhist religion, with a substantial Tamil (Hindu) minority. Many smaller ethnic minorities also exist, and indeed diversity is a hallmark of Sri Lanka: in people, religion, language, terrain, flora and fauna, climate and economic activity it has great variety. Table 1.1 presents some basic data on the economy.

Table 1.1 Sri Lanka: Basic economic statistics

	1991	1992	1993	1994	1995	1996
Population (m)	17.4	17.7	17.9	18.1	18.4	18.6
Labour force (m)	5.9	6.0	6.1	6.1	6.2	6.2
Unemployment rate (%)	13.8	13.3	13.8	12.1	12.0	11.6
GDP (1990 prices) (Rs b)	333.2	347.8	371.9	392.9	414.6	430.2
GDP per capita (1990 prices) (Rs)	19 149	19 650	20 777	21 707	22 533	23 128
Annual growth of real GDP (%)	4.6	4.4	6.9	5.6	5.5	3.8
Annual growth of real GDP per capita (%)		2.6	5.7	4.5	3.8	2.6
Exports as % of GDP		31.8	33.8	33.8	35.6	35.1
Imports as % of GDP		41.0	43.3	45.6	46.0	43.8
Investment as % of GDP		23.9	25.2	26.1	25.7	24.2
Annual average rate of exchange (Rs per US\$)	41.4	43.8	48.2	49.4	51.2	55.3
Annual inflation, GNP deflator (%)	11.2	10.0	9.5	9.4	8.3	12.3

Source: Central Bank Annual Report 1996

Despite considerable economic development since it gained independence from Britain in 1948, Sri Lanka remains a low income country by international standards, with a per capita Gross Domestic Product (GDP) of about US\$760 at 1996 market prices. Among countries of this income level, however, Sri Lanka stands out for the high levels of education and health that have been attained, and for the stability of its population size. Free, compulsory education from age 5 to 15 has led to 90% of the population aged 10 and over being classified as literate in 1995. Life expectancy at birth was 72 years in 1993, and the annual rate of population growth in 1996 only 1.1%. Levels of education among females are close to those among males, and females make up around one third of the labour force.

Steady growth in per capita GDP is lifting Sri Lanka out of the World Bank's low income classification into the lower-middle-income category. This will mean less access in future to concessionary finance. Already the contribution of foreign aid to the economy is small (1.4% of GDP in 1995 and 1.1% in 1996, the bulk of this coming from Japan and Norway). Around double this amount has recently been devoted to servicing foreign loans. Foreign investment in industry, including privatisation proceeds, has been rising and is now approaching 10% of GDP; however this inflow is almost balanced by substantial outflows, reducing net foreign investment to only around 1% of GDP.

Household income remains low, for the most part well below the level at which a telephone might be acquired (even for inbound calls only). This is discussed further in section 3.4.3 below. When looking at income figures, it should however be borne in mind that price levels are also low; one estimate of per capita

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GDP in purchasing parity terms in 1995 was as high as US\$3,600². Average household size has declined from 5.6 in 1971 to 4.6 in 1994. About 20% of households are classified as below the poverty line.

The high level of human development has been accompanied by strong development of the service sector in the economy. Despite Sri Lanka's deserved reputation as an exporter of tea, coconuts, rubber and gems (it remains the world's number one tea exporter), the primary sector in Sri Lanka's economy has fallen to under a quarter of GDP. By contrast the secondary sector (manufacturing, particularly garments, and construction) is accounting for a growing share of GDP, and the tertiary sector (services and utilities, including tourism, which contributes about 2%) around one half. These sectors are also providing virtually the whole amount of economic growth. The economy is increasingly outward-oriented, with exports amounting to 33% of GDP in 1996, and imports to 43%.

The activities accounted for by the secondary and tertiary sectors naturally make more intensive use of telecommunications than the primary producer sector. However, Sri Lanka's teledensity has been at or below the average for a country of its income level. This suggests that the teledensity is below what would be appropriate for Sri Lanka's economic activity mix. The annual revenues of Sri Lanka Telecom Ltd (SLT) are around 1.5% of GDP. SLT's workforce of around 8,000 still represents the bulk of employment in telecommunications, which contributes only marginally (of the order of 0.15%) to national employment, but with a very high added value per employee. Around 1.6% of the workforce is employed directly or indirectly in tourism.

The unemployment statistics give an overoptimistic picture because they omit underemployment, which is estimated to affect 38% of the workforce (16% of them seriously, in that they work for less than 20 hours per week)³. Driven by poor job prospects at home, many Sri Lankans work abroad, 60% to 70% of them in the Middle East, and their home remittances make a significant contribution to Gross National Product and to the balance of payments. Private remittances are forecast to reach Rs 50 b (US\$833m) in 1997 and to continue to grow by 10% each year.

1.2 Government policies

The early post-independence governments tended to pursue policies of nationalisation and central planning. These had poor results, ultimately resulting in shortages of many goods and high unemployment. Since the change of government in 1977, these policies have been reversed in favour of new ones designed to encourage foreign investment in Sri Lanka, permit imports and stimulate exports. At the same time alleviation of poverty has remained a priority. The civil unrest which has plagued Sri Lanka since 1983 has, however, consumed large resources and held back development. In particular, it continues to prevent tourism from realising its great natural potential.

The government which came to power in 1994 has continued and strengthened these liberal economic policies, supported by the World Bank and the International Monetary Fund. Many large enterprises in various sectors have been fully privatised, and private participation has been encouraged in others. These policies are exemplified by the changes in telecommunications which are discussed below - notably by the licensing of competitors to Sri Lanka Telecom Limited and the sale of a 35% shareholding in it, with management control, to NTT. Sri Lanka is a World Trade Organisation (WTO) Member and is committed to free market principles. Relatively advanced among the countries of South Asia, Sri Lanka aspires to the successes of the East Asian tiger economies (while avoiding their recent financial problems). The government is keenly aware of the key role of government controls in these successes, and does not intend to abdicate this role.

These policies appear to be producing satisfactory results. In the last three years, budget deficits have reduced from over 10% to 7% and annual inflation has fallen from 14% to 7%. Real GDP growth is expected to increase from 4% in 1996 to around 6% in 1997. Unemployment is down from 14% in 1993 to a fairly stable level of around 11%. Given further specified reforms and a reduction in civil strife, the Central Bank regards a medium-term annual growth rate in GDP of 7% to 8% as feasible.

² World Bank; a more recent IMF estimate is however only US\$2215.

³ T. Somasekaram, Chief Editor, *Atlas of Sri Lanka*, Arjuna Consulting, Colombo, August 1997.

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It is important to note that the subject of international telecommunications and settlements has a strong political, as well as economic, element. In particular, Sri Lanka is a leading member of the South Asian Association for Regional Co-operation (SAARC), whose other members are India, Pakistan, Bangladesh, Nepal, Bhutan and the Maldives. Among other co-operative aims, members are committed to creating a regional free trade area before 2005. Decisions about telecommunications must take account of this broader context.

1.3 Telecommunications in the Sri Lankan economy

The direct contribution of telecoms to GDP is at a normal level of around 1% to 2%. However, the discussion above of the importance of telecoms-intensive industries in the economy points to the indirect contribution of telecoms being much greater than this. Furthermore, if the hypothesis above about Sri Lanka's teledensity lagging its economic development is correct, then inadequate telecoms could currently be acting as a brake on economic growth.

Moreover, telecoms investment could prove to be a vital enabler for new patterns of growth. It has been argued⁴ that the high level of education of the Sri Lankan people could make Sri Lanka, if equipped with the necessary infrastructure, a natural home for new information-industry activities such as telemarketing and customer service call centres, remote data-processing, computer programming and production of content for the Internet and other electronic media.

As in many developing countries, there is a heavy concentration of commerce and telecommunications in the capital, Colombo. The entire island is, however, relatively evenly (and densely) populated, with 80% of the people living in rural areas. Table 1.2 summarises some statistics (based on figures from 1994 to 1997) showing that there is big potential for areas outside the capital to increase their take-up of telecoms, with corresponding economic progress. Western Province is shown in Figure 1.1; it covers Colombo, Gampaha and Kalutara Districts, in other words it is a generous interpretation of Greater Colombo. The "village" is the smallest administrative unit, and averages about 500 population.

Table 1.2: Regional development indicators and teledensity

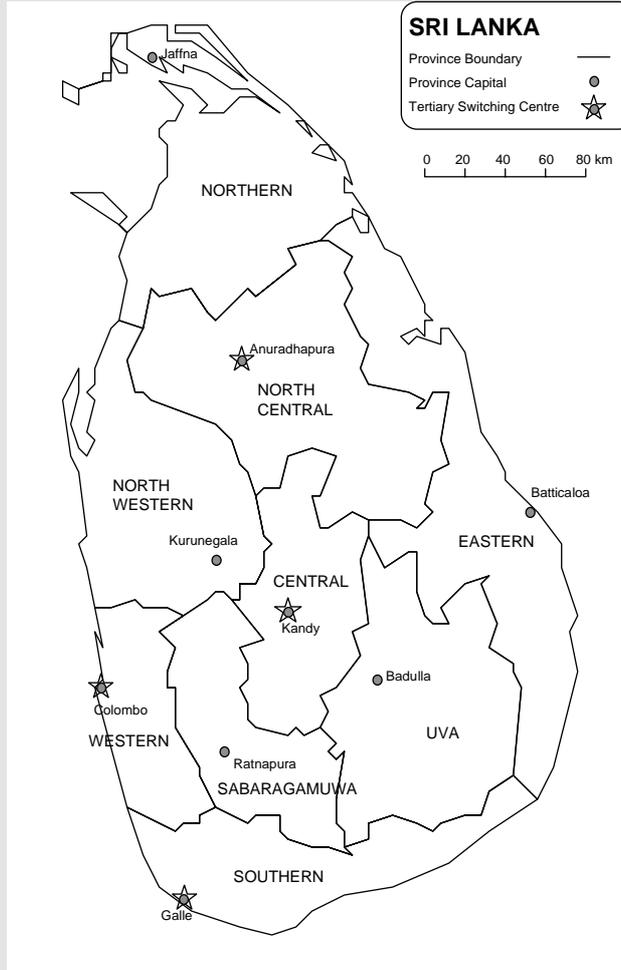
	Western province	Rest of island	Sri Lanka
Population, m (1994)	4.4	12.6	17.0
Population density per sq km	1190	204	260
Number of villages	5,309	31,991	37,300
Number of payphones (1996)	1,902	846	2,748
GDP per capita (Rs)	38,000	17,500	23,000
Mean household income (Rs)	57,000	37,500	42,500
% of total GDP	43	57	100
% of fixed lines	70	30	100
Payphones per village (1996)	0.36	0.03	0.07
Fixed lines per 100 people (1997)	4.5	0.6	1.6

Source: Statistical Abstract 1996, SLT, TRCSL, Atlas of Sri Lanka

⁴ Shelton A Gunaratne, Mohd Safar Hasim, and Roukaya Kasenally: *Small is Beautiful: Informatization Potential of Three Indian Ocean Rim Countries*, Amic conference, Singapore, June 1997 (available at <http://www.moorhead.msus.edu/~gunarat>).

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Figure 1.2 Map of Sri Lanka



Source: SLT

1.4 International telecommunications and the wider economy

Just as the direct contribution of telecoms to the Sri Lankan economy is only a few percent, so the actual revenues associated with international telecoms are not great in the context of the economy as a whole. A major concern to this study is the net inpayment from international settlements, which currently stands at around 3.5 Rs b (US\$58m). Though this is nearly 40% of SLT's revenues (net of outpayments - see fuller discussion at 3.3 below), it is under 10% of remittances from expatriate Sri Lankans. It is around half the level of overseas aid. Table 1.4 reproduces two views of the balance of payments, as presented by the Central Bank. The overall picture is that net international revenues, accounting for more than 10% of services sold, make a significant contribution to Sri Lanka's foreign exchange requirement.

The indirect importance of telecommunications far outweighs its direct importance. Because of the outward-looking stance taken by government economic policy, this is doubly true for international telecommunications. It is clear that three vital aspects of economic activity—trade, tourism and expatriate remittances—are intimately linked with international telecommunications. The combined value of these activities is around half of GDP. Furthermore, high quality, competitively priced international and domestic telecommunications facilities, added to Sri Lanka's well-qualified workforce and other attractions, could persuade companies establishing a South Asian base to locate it in Sri Lanka.

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Table 1.3 External resource use

	1992	1993	1994	1995	1996
Foreign receipts (Rs b)	162	205	238	289	325
Exports (Rs b)	108	138	159	195	227
Services sold (Rs b)	30	36	44	53	52
Expatriate remittances (Rs b)	24	31	35	41	46
Foreign payments (Rs b)	226	274	328	378	431
Imports (Rs b)	154	194	236	273	300
Services bought (Rs b)	32	34	44	53	57
Capital repayments (Rs b)	33	33	30	41	63
Other (Rs b)	8	13	18	12	12
Gap (payments - receipts) (Rs b)	64	70	89	88	106
Government (grants etc) (Rs b)	27	30	30	43	34
Private sector (Rs b)	38	61	71	41	61
Other (Rs b)	(1)	(21)	(12)	4	11
Current account balance (Rs b)	(19)	(27)	(37)	(33)	(30)
Net settlement payments (Rs b)	2.3	2.1	2.5	3.3	3.5
Net international revenues (Rs b)	3.9	3.9	4.6	6.0	6.6
Net int'l revenues as % of Foreign receipts	2.4%	1.9%	1.9%	2.1%	2.0%

Source: Central Bank Annual Report 1996, Sri Lanka Telecom Ltd.

Table 1.4 USA - Sri Lanka financial flows, 1996

Finance flowing to the USA	Rs m
Sri Lanka settlement to USA	110
Sri Lankan imports from USA	11 000
[Revenues retained by USA carriers for calls to Sri Lanka	280]
Finance flowing to Sri Lanka	
USA settlement to Sri Lanka	820
Sri Lankan exports to USA	77 000
USA aid to Sri Lanka	1 100
[Revenues retained by SLT for calls to the USA	90]

Sources: SLT, FCC, Central Bank Annual Report 1996, study estimates

2. TELECOMMUNICATION POLICY AND NETWORK DEVELOPMENT

2.1 Telecommunications policy

2.1.1 Overview

The present Government of Sri Lanka has a clearly articulated National Telecommunications Policy in keeping with its broader economic policy. The full policy statement runs to several pages⁵. Its main points are:

- recognition of the importance of this sector and the need for its rapid and radical expansion;
- the necessity for strong private sector participation in order to achieve such expansion;
- the need for cost-based tariffing;
- a series of demanding specific targets for service roll-out and quality;
- the desirability of maximising Sri Lankan input to the required construction and manufacturing effort.

2.1.2 Recent evolution of policy

This policy is being implemented within a legislative framework first brought in by the previous government. Until 1991 nearly all telecommunications services were provided by the sole telecommunications operator, a government department (Sri Lanka Telecommunications Department) under the Ministry of Posts and Telecommunications. A private cellular operation, **Celltel Lanka**, was launched as a joint venture between Millicom and four local companies in 1988, and a small private paging operation had been licensed since 1981. The first step in reform was the passage in 1991 of the Sri Lanka Telecommunications Act. On the model of the 1984 United Kingdom Telecom Act, this Act's main effects are to:

- introduce a framework for licensing by the Minister of any number of network operators (and also for licensing use of the radio spectrum);
- set up an independent regulator, the Director General of Telecommunications (DGT), with support staff, to advise the Minister on licensing, to police adherence to licence conditions and generally to promote the public interest in telecommunications;
- convert the Department into a state owned corporation (**Sri Lanka Telecom** or SLT⁶), capable of commercialisation. This conversion actually took place in 1996.

Following this Act, for some years SLT retained a *de facto* monopoly in basic fixed voice communications. However, for all other services a liberal licensing policy was adopted, and many new licences were granted. This led to considerable growth, especially in mobile services. Cellular mobile was often used not just as a mobile service, but as a basic voice service which unlike an ordinary fixed line was easily available (albeit at a considerable price premium).

The biggest step, however, was the licensing in March 1996 of two new companies to compete directly with SLT by providing fixed telephony using Wireless Local Loop (WLL) technology. The two WLL operators are **Lanka Bell** (originally a Bell Canada company, now owned by GTE and a local partner, using Nortel equipment) and **Suntel** (owned by Telia and a local partner, using Ericsson equipment). After a delayed start these two operators are now building up a significant subscriber base. Their licences require them each to serve 100,000 subscribers by the end of the year 2000. Table 2.1 shows the number of licensed operators and their approximate numbers of subscribers.

⁵ *National Policy on Telecommunications*, Government of Sri Lanka, 1994.

⁶ Since August 1997, the formal name of the company is Sri Lanka Telecom Ltd. For the purposes of this report, the abbreviation SLT has been used.

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Amendments to the 1991 Act were passed in 1995, with the main effects of:

- transforming the regulator from a Director-General's Office into a five-person Commission, with more autonomy from the Ministry and enhanced ability to hire qualified staff;
- enabling the licensing and thereby control of resale services such as the private agencies, which were operating without controls as this had not been foreseen in the 1991 Act.

A 1996 policy statement⁷ announced the government's intention of a pause in the issuing of new telecoms licences for basic voice telephony until after a review to be carried out in 2000. Other important items in this statement were:

- a second international operator to be chosen by competitive tender and licensed to operate from 2000 (this has since been postponed to 2002 as part of the privatisation package);
- international operations to remain a duopoly for five years, with the exception of separately licensed Global Mobile Personal Communications Services, which would be expected to set up their own gateways;
- all tariffs to be cost-based, with operators expected to be able to substantiate this by providing detailed cost information by the end of 1998;
- SLT to eliminate cross-subsidy between its international and domestic operations by the end of 1999, and to complete tariff rebalancing by 2002, when a price cap is to be introduced (again the timing was changed in the privatisation negotiations - it matches the end of the international monopoly);
- interconnect charges to be cost-based from end 1998 when cost data permit it.

Consistent with the stated policy on the international monopoly, international leased circuits may not carry voice traffic and may not interconnect with the Public Switched Telephone Network (PSTN). Call-back is not illegal, however.

The current position on interconnect has recently been summarised as follows by the Director General of Telecommunications⁸:

The Telecom Act of 1991 (as amended) requires operators to reach agreement on interconnection and submit their plans for Telecoms Regulatory Commission (TRC) approval. In the absence of agreement between parties, the Commission has the power to determine the interconnection charges. So far, there has not been an agreement between the dominant operator and new operators, with the exception of standard agreements imposed on two mobile operators by SLT. There are simple sender-keep-all type agreements among the mobile operators and also among the mobile and wireless local loop operators.

The three local exchange operators function under an interim interconnection agreement, effective until December 1998. Local and national calls are connected on the basis of "sender keeps all". The WLL operators terminate incoming international traffic for no charge, but receive a 35% discount for international traffic originated by them. The TRC has announced an alternative dispute resolution process to bring the parties to agreement on the terms and conditions of a permanent interconnection agreement by December 1998.

There are no formal interconnection agreements between the mobile operators and SLT and between the mobile operators and the two WLL operators. The current arrangement includes charging all calls to mobile operators as national calls and the treatment of all mobile-originated calls as though they were calls from SLT subscribers. The TRC is considering a full-fledged effort to move these parties to a formal interconnection agreement as well.

During 1998, obtaining soundly-based costs for SLT's various services in order to arrive at equitable interconnection and other prices will be a priority for both the regulator and SLT.

⁷ *Restructuring of the telecommunications industry - regulatory policy of the Ministry of Posts and Telecommunications*, 1996.

⁸ Rohan Samarajiva, TELECOMMUNICATION POLICY IN SRI LANKA: OVERVIEW AND PROSPECTS, for presentation at the Seminar on Telecommunication Policy Administration, 25-27 February 1998, Tokyo, Japan.

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The initial Sri Lanka commitments under the WTO basic telecommunications agreement in February 1997 offered an end to the international monopoly in 1999 subject to the completion of rebalancing by that date; but rebalancing is now expected to be complete only in 2002. Foreign equity participation of 35% was to be invited in SLT, and this was realised in August 1997 with the sale of a 35% shareholding, with management control, to NTT.

Table 2.1 Telecoms licensees and lines, end 1997

Service	Licensees	Lines/Subscribers ('000)
Basic fixed voice services (SLT)	1	327
WLL operators	2	26
Payphones	1	3
Cellular mobile	4	118
Trunked private mobile radio	1	1
Paging	5	11
Data comms/ Internet service providers	9	n.a.
Private networks and leased circuits	2	n.a.
Total	25	n.a.

Source: TRCSL

2.1.3 Licence conditions

The licence conditions on SLT are modelled on those in British Telecom's licence, and are by no means all currently applicable. For example, there is a provision for a price cap, but this is suspended until rebalancing is complete. Important and operative conditions include:

- prohibition of cross-subsidies from SLT's monopoly services to its competitive ones, as soon as rebalancing has been accomplished;
- requirement for the regulator to approve all tariff changes;
- general prohibitions on anti-competitive behaviour and on undue discrimination.

An addition to the licence at the time of privatisation guarantees that no new fixed network competitors will be licensed for 5 years, that is, not before August 2002.

The most important licence conditions on the new WLL operators are basic rollout requirements:

- 100,000 subscribers must be served by the end of the year 2000. An incentive scheme is built in: if this target is achieved then the operators will be allowed a further 5 years' operations without additional direct competitors being licensed, while for any year from 1999 onwards, if they are serving less than 40,000 subscribers a penal licence fee of Rs 100 m (US\$1.7m) will be levied.
- There is an incentive for some lines to be provided in each of the 28 secondary areas (defined by the catchment for SLT's Secondary Switching Centres). From 1998 onwards, an annual fee of Rs 5 m (US\$0.8m) will be charged for each secondary area having less than 10 connections.
- Call completion rates are to be continuously above 50%.

2.2 Network development

2.2.1 SLT's network evolution

Fixed line teledensity in Sri Lanka has grown slowly, from well under 1 line per 100 inhabitants in the early 1980s to around 1.4 now. Table 2.2 shows how the growth rate in SLT's lines has risen significantly since 1993. The WLL operators are now beginning to contribute - see Figure 2.1. Separate data on lines in Colombo have been available since 1992. Over that period the percentage of lines in Colombo has remained

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steady at about 67% (compared with only around 12% of the population in Colombo). A slowly growing proportion of lines, now up to around 55%, is classified as residential, with 35% business and 10% official and “others ” (probably religious institutions, which attract a reduced tariff). Over 75% of new lines now being connected are in the residential category.

Table 2.2: Growth in SLT’s main lines, 1990-97

	1990	1991	1992	1993	1994	1995	1996	1997
Main lines ('000)	121	126	136	158	181	204	254	325
Increase since previous year (%)	15.1	3.7	7.7	16.4	14.6	13.1	24.5	27.7

Source: SLT. Numbers in italics are estimates.

Over the entire period, demand for lines has far outstripped supply, with a majority of potential customers having to wait several years for a line to be installed. Waiting list figures are not reproduced here, because their fluctuations as often reflect changes in the conditions for joining the waiting list as changes in reality. However, the “official” waiting list has not dropped below a third of the installed base, and now stands at around the same level. Often actual line provision has not lived up to investment levels, with plant being poorly utilised for a variety of reasons.

In 1993 a new government-owned company, **Sri Lanka Telecom Services Ltd**, was set up specifically to implement a turn-key project to install 150,000 new lines. In recent years the actual of new lines provided each year has risen dramatically, with a record 70,000 now estimated to have been provided during 1997. The 1996 achievement was already world-class (Sri Lanka was 10th among all countries which have reported figures to the ITU), and 1996 is plainly set to be outstripped by the 1997 achievement.

A complete nationwide Subscriber Trunk Dialling network is in place. The 283 local exchanges are divided into 28 code areas each served by a Secondary Switching Centre, in turn connected to one of the four Tertiary Switching Centres (see Figure 1.1). A fifth Tertiary Switching Centre is planned in Gampaha to complete the switching hierarchy. Trunk transmission is mostly by microwave links; some optical fibre cable has recently been installed between local exchanges in Colombo.

All recently installed exchange equipment is digital, and in the last few years most older exchanges have been modernised, resulting in a network that is now 98% digital. Digital systems manufactured by (among others) Alcatel, AT&T, NEC, Nokia, Mitsui/Goldstar, and L M Ericsson, are in use, reflecting foreign aid from their respective home countries.

In 1996 SLT had about 60 national leased circuits (in addition to the 50 international leased circuits discussed below). Air Lanka, SITA, and a few large banks have private networks.

Service standards have improved from the levels experienced around 1990, when around 25% of calls were completed successfully. However, call completion rates remain poor, mainly because of the called party already being busy (this occurs 50% of the time), a situation clearly linked with the shortage of lines. In addition, there are high fault rates, mainly on outside plant, much of which is overhead and exposed to weather and other hazards. The current target fault rate is 10 faults per 100 lines per month; current achievement varies widely from place to place. The percentage of faults cleared by the following day has risen from 55% in 1993 to around 60% now.

To summarise, SLT has considerable recent achievements to its credit. It also faces major continuing challenges which, under new management, it is now tackling energetically:

- eliminating the waiting list, so as to supply service on demand by the end of 1999. This in turn entails both making fuller use of existing installed plant, and extensive new plant build.
- meeting the competition for new customers from the wireless local loop operators, now in Colombo and later elsewhere. This entails improved marketing and customer service interfaces on top of the basic

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actions already mentioned to make service available. Introducing new services is a further element with longer-term revenue implications.

- raising call completion rates. Apart from reducing the incidence of called customer busy by increasing line supply, this means enhancing trunk routes to avoid busy hour congestion, and improving both curative and preventative maintenance, especially on outside plant.
- rapidly rebalancing tariffs to enable any cross-subsidies to be eliminated and the international business to become fully competitive.
- reducing costs. This will be achieved largely through more efficient growth, that is, a much smaller increase in the number of employees than in the number of lines. It will be made easier by the natural economies of scale that will accompany system growth.

2.2.2 Other networks

Accessibility of telephones is not quite as bad as the SLT figures suggest, at least in Greater Colombo, because of the growth in cellular services, public payphones, and the large number of small private agencies offering national and international phone and fax service to the public (at marked-up SLT prices). If cellphones are included, the teledensity rises to a more encouraging figure of 2.3 per hundred.

There are actually four operators of payphones, three of which are using SLT's cable network and therefore do not need separate licensing. (The last has its own radio system). Between them, at the end of 1997, they were operating about 800 coin-operated and 2400 card-operated payphones. SLT itself provided about one-third of this total. This number of payphones, although it has increased greatly in recent years, is still way below requirements and will continue to grow fast. Table 1.2 shows that there is about one payphone per 30 villages outside Western Province. The current total of over 3,000 payphones still compares poorly with the 4,200 post offices and 11,000 schools in Sri Lanka.

The two WLL operators were licensed in the spring of 1996, and only started operations towards the end of that year. Between them they connected 11,000 subscribers in the first half of 1997, and nearly doubled that number by the end of October. Like the cellular operators before them, initial network coverage is planned to be Greater Colombo plus a broad western coastal strip from Negombo to Galle, plus Kandy. This will eventually be extended to other important towns and further along the coast in both directions.

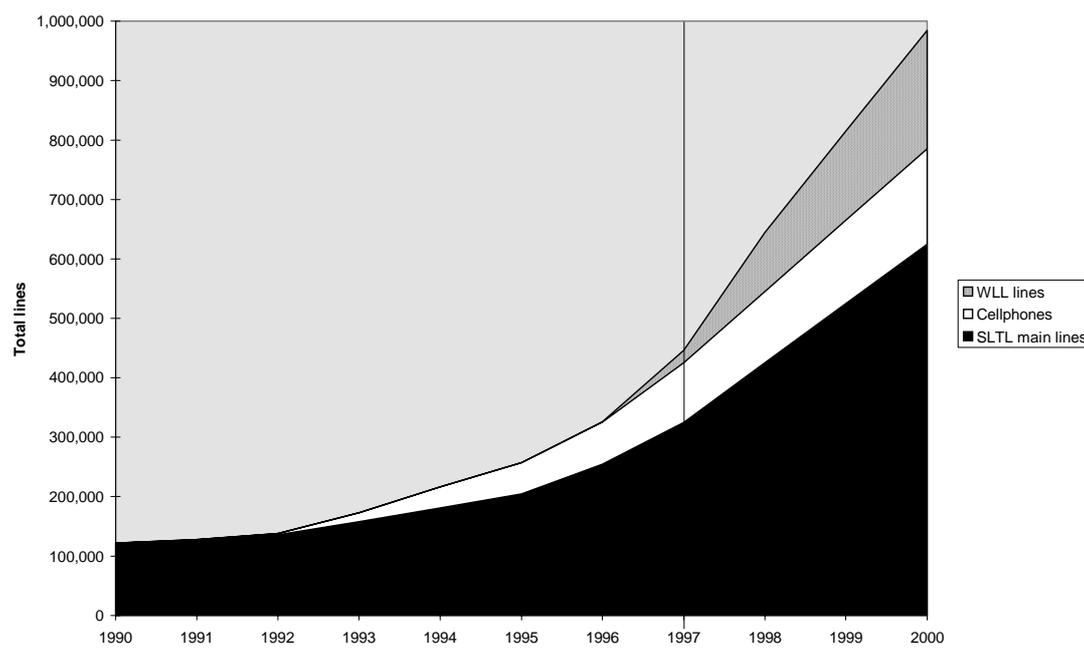
As may be seen in Table 2.11, the WLL operators have set their call charges close to SLT's, but their installation and rental charges are much higher. They both offer various packages for business and residential users, including options for enhanced services such as call forwarding and conference calls. They expect that, within 5 years, SLT's share of the fixed line market will have fallen to around 50%, with the remaining 50% divided between the two WLL operators.

Table 2.3 **Subscribers to cellular mobile and paging services**

	1991	1992	1993	1994	1995	1996	1997
Cellular mobile ('000)	1.8	2.6	14.7	35.5	52.9	71.0	118
Paging ('000)	2.4	3.0	4.6	6.7	9.6	10.7	10.8

Source: TRCSL

Table 2.3 shows the growth since 1991 in subscribers to cellular mobile and paging services. From a later start, and despite high tariffs, cellular mobile has rapidly caught up with and overtaken paging. As mentioned above, cellular has undoubtedly benefited from the waiting lists for fixed lines. Figure 2.1 shows the history to date of both fixed and cellular connections, with some study projections.

Figure 2.1 Fixed and mobile lines

Source: SLT, TRCSL, Case Study

2.2.3 Investments in telecoms

The old Department's investments were mainly financed by credits from various development bodies (Asian Development Bank, the Japanese Overseas Economic Co-operation Fund, etc). The newly established SLT took these over and began to fund new investment from its own resources. Continuing government guarantees meant that from 1991 SLT had little difficulty in obtaining suppliers' credits (though it is now being questioned whether this treatment remains appropriate after partial privatisation). In some cases important links with the international accounting regime were also introduced, with the settlements due to SLT from a foreign country actually being used to pay off money owing on an earlier purchase of equipment from that country.

Table 2.4: SLT's investments, 1990-1995 (Rs b)

	1990	1991	1992	1993	1994	1995	Total, 1990-5
Budgetary allocation	1.1	1.4	3.2	1.9	3.7	3.5	20.6
Actual expenditure, government funds	0.6	0.8	0.2	0.4	3.7	2.4	8.1
Actual expenditure, SLT funds	-	-	1.5	2.6	3.1	2.5	9.6
Actual expenditure, total	0.6	0.8	1.7	3.0	6.7	4.9	17.7
Total as % of national investment			1.7%	2.4%	4.4%	2.0%	

Source: SLT

Table 2.4 shows planned and actual investments in the recent past, as quoted in the government policy statement. Underspending in the early years reflects the tying of overseas aid disbursements to actual project progress, which was delayed. However over the period as a whole 86% of planned spending was achieved, with SLT itself funding 54% of the total. Telecoms investment has run at a few percent of total

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national investment (gross domestic fixed capital formation), which in turn, as shown in Table 1.1, has been around 25% of GDP; thus telecoms investment has been up to about 1% of GDP.

Table 2.5 shows an alternative presentation of past telecommunications investment, together with telecommunications revenue and equipment imports.

Table 2.5: Telecommunications revenue, investment and equipment imports (US\$ m), 1990-96

	1990	1991	1992	1993	1994	1995	1996
Telecommunications Revenue	86.8	118.2	125.9	137.6	172.6	218.6	358.7
Telecommunications Investment	14.8	18.6	8.9	59.9	236.6	n.a.	n.a.
Investment as a % of revenue	17.0%	15.7%	7.1%	43.5%	137.1%	n.a.	n.a.
Imports of telecoms equipment	18.5	15.8	45.5	48.6	83.0	n.a.	n.a.

Source: ITU World Telecommunication Indicators Database.

The Telecommunications Master Plan for Sri Lanka, written by the Japanese consultants JICA in 1996, envisaged a relatively modest further total investment of Rs 8 b (US\$133m) in telecoms during the period 1996-2000. Since the arrival of the new NTT management at SLT in August 1997, however, plans have become much more ambitious. SLT announced in December 1997 that in 1998 alone, Rs 23 b (US\$383m) would be invested, and a further Rs 17 b (US\$283m) in 1999, to provide 300,000 new connections by the end of 1999, thereby eliminating the waiting list; more than double the previous record rate of provision. This investment amounts to some 2% of GDP, again double the previous record. High investment is set to continue for the following three years. New services to be introduced by the end of 1998 include improved Internet and email access, Internet voice and voicemail, International Business Communications Services in co-operation with British Telecom, an SLT Calling Card, ISDN, and enhanced data services.

The plans of the newly licensed operators are equally ambitious. Table 2.6 shows actual cumulative investments up to 1995, and thereafter long-term projections.

Table 2.6 Actual and planned cumulative investments by newly licensed operators (Rs b)

	1992	1993	1994	1995	2000	2005	2010
Cellular mobile	0.4	1.3	3.0	4.5	19.3	59.1	87.3
Datacomms	0.2	0.3	0.4	0.5	1.5	3.0	6.0
Paging	-	0.1	0.2	0.2	1.4	2.8	4.3
Payphones	-	-	0.1	0.4	3.4	5.4	7.5
WLL operators	-	-	-	-	15.0	30.0	60.0
Total	0.6	1.9	3.9	6.0	39.3	99.5	165.1

Source: TRCSL, Case Study estimates (WLL)

As may be imagined from the figures in this section, projections for future demand have varied significantly and continue to do so. By the year 2015, a gross teledensity of 10 per hundred (including both fixed and mobile phones) could be achieved by sustained annual growth at 8%. This would amount to some 2 million lines and seems a reasonable, if stretching, base figure for long-term planning.

2.3 Tariffs

2.3.1 SLT tariffs

By the standards of other countries, SLT's domestic tariffs are rather low. In particular, its rentals are extremely low and its domestic call charges reasonable; these are partly made up for by high installation

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charges and rather high international call charges. Restructuring has already led to a low distance differential (there are only two tariff bands, local and long distance, with the latter costing 2.4 times as much as the former). After several years of tariff stability, accelerated tariff rebalancing is now under discussion with the regulator, with the aim of raising 50% more domestic revenue by the end of 1999.

All tariffs in the following tables exclude turnover tax. The relevant tax rates are shown in Table 2.7 below. Note that the rate passed on by SLT to the customer has not normally been the same as that charged by the Government to SLT.

Table 2.7 Rates of turnover tax

Date operative	1.9.91	15.5.92	7.11.92	1.3.93	1.1.96	1.2.97	6.11.97
Rate to SLT	5%	10%	20%	20%	20%	20%	18%
Rate to customers	-	-	-	9%	20%	25%	22%

Source: SLT

Table 2.9: SLT domestic tariffs (Rs, excluding turnover tax)

	1990	1991	1992	1993	1994	1995	1996	1997
Normal connection charge	7'500	7'500	13'000	13'000	13'000	13'000	13'000	13'000
Annual rental	960	960	960	960	960	960	960	960
Local call (3 min) min	2.2	2.2	2.7	2.7	2.7	2.7	2.7	3.5
Local call (3 min) max	2.7	2.7	2.7	2.7	2.7	2.7	2.7	3.5
Long distance call (3 min) min	5.4	5.4	6.5	6.5	6.5	6.5	6.5	8.2
Long distance call (3 min) max	27.0	27.0	6.5	6.5	6.5	6.5	6.5	8.2

Source: SLT

At the time of the 1992 tariff reform, call charges were greatly simplified. The previous two charge bands for local calls (own exchange and own group switching centre) were reduced to a single band, as were the previous five distance-dependent trunk charge bands.

A time-of-day discount structure has been retained throughout. The rates shown in Table 2.9 are for peak rate periods, during working hours. Standard rate periods, during lunch-hours and evenings, offer a discount off peak-rate calls and economy rate periods, at night and all day Sundays, further discounts. Table 2.10 gives full details of SLT's current discount periods and rates; these are broadly followed by other operators also. A further complication in SLT's rate structure is that a reduced unit fee of 1.1 Rs (US\$0.018) (instead of the full unit fee of 1.65 Rs (US\$0.027)) applies for the first 200 units used each month on any line; the tables assume that the full unit fee applies.

Table 2.9: SLT's call charge discounts

	Local calls	Trunk calls	International calls
Peak rate: 0800-1200, 1400-1800, Mon-Sat	100%	100%	100%
Standard rate: 1200-1400, 1800-2200, Mon-Sat	72%	60%	80%
Economy rate: all other times	36%	30%	65%

Source: SLT

Table 2.10 shows SLT's main current tariffs compared with those of the two new WLL operators, and typical tariffs for cellular and other services. All call charges are for a 3 minute call at peak rate, and, where applicable, to the most expensive destination. Where a range of rental/call charge packages exists a mid-range package has been chosen, for residential rather than business.

Table 2.10 Representative telecom tariffs, end 1997 (Rs, before turnover tax)

	Installation	Yearly rental	Local call (3 min)	National call (3 min)	International call (3 min)
SLT	13,000	960	3.5	8.2	363
Suntel	23,900	2,280	3.0	7.2	363
Lanka Bell	21,000	2,400	4.2	9.0	363
Payphones	-	-	13.1	20.6	570
Cellular (digital)	5,000	6,000	24	24	387
Internet access	5,000	9,000	24	24	24

Sources: TRCSL, company literature

2.4 International telecommunications infrastructure

The number of international circuits between Sri Lanka and the rest of the world has increased greatly in recent years, as shown in Table 2.11. Circuit growth has outstripped traffic growth, because of modular provision (in 30 circuit modules) and so as to offer a better grade of service. As at June 1997, these circuits were provided using five separate satellite systems (at two earth station sites) and two submarine cables, as outlined in Table 2.12. Currently there is significant spare capacity.

Table 2.11 International voice-grade circuits

	1991	1992	1993	1994	1995	1996	1997
Circuits	375	481	630	984	1'291	1'536	1'670

Source: SLT

Table 2.12 International telecoms infrastructure, 1997

International link	Number of destinations	Number of circuits
Satellite system 1	4	65
Satellite system 2	2	5
Satellite system 3	10	88
Satellite system 4	9	336
Satellite system 5	15	503
Cable 1 (coaxial)	14	150
Cable 2 (optical fibre)	18	492
Total, satellite	40	997
Total, cable	32	642
Total, satellite and cable	72	1 639

Source: SLT

In all, direct routes exist to 41 countries. Multiple carriers in some countries bring the total up to 48 separate routes. Eleven of the 48 use both cable and satellite circuits; several use circuit groups on more than one separate cable or satellite system. Routes vary in total size between 1 and nearly 200 circuits; 11 countries have more than 50 circuits.

This capacity increase has been brought about by an ambitious programme of expanding facilities over the same period. In particular:

- The Padukka - 01A NEC Standard A Satellite Earth Station, commissioned in 1975 and recently upgraded to support digital transmission, was supplemented in 1995 by a new Padukka - 02A NEC Satellite Earth Station. A further, Standard B-IDR Scientific Atlanta Earth Station in Colombo was commissioned in 1993. The 1975 Padukka - 01A Antenna Tracking System is now due for refurbishment.
- SLT has a 2.7% investment share (amounting to some US\$19m) in the SEA-ME-WE II digital optical fibre submarine cable, linking the countries of the Indian Ocean to those of the Mediterranean via the Red Sea. This was brought into service in October 1994, making available a capacity of 504 circuits to supplement the 150 on the existing SEA-ME-WE I coaxial cable.
- There are two digital international gateway exchanges, both located in Colombo, a NEAX 61E providing around 1000 international circuits and a 5ESS providing around 700. The NEAX provides CCITT no 7 signalling, and the 5ESS gateway is due to be upgraded to SS 7 by early 1998.
- The contract was started in June 1997 for the SEA-ME-WE III cable, a new high capacity optical fibre link from the UK to Thailand via the Middle East and Sri Lanka. It is scheduled for completion in December 1998. Its cost to SLT is estimated at US\$25m.
- An additional project has been identified (but no contract yet let) to provide another international gateway exchange with 5 300 trunk capacity, and an INTELSAT Standard A type satellite earth station. The scheduled date of completion is 2001.

The quality of service provided by the international gateways is notably better than the average for SLT's network, with around 50% of all busy hour call attempts being successfully completed (compared with an overall figure around 35%). However, it is recognised that clear room remains for improvement towards the 60-65% which is achieved elsewhere.

2.5 International telecommunications services

Because it can easily lead to high bills, international direct dialling (IDD) is not automatically accessible from ordinary SLT lines. IDD access has to be specifically requested and a deposit of at least 5'000 Rs (US\$83) paid. Only around 25'000 SLT main lines in service currently have IDD access, although a further 5'000 can make international operator calls (this entails a lower deposit - 1'000 Rs (US\$17) - and allows collect calls to be made). Again, the distribution of IDD lines is concentrated on Colombo, with 10.2% of Colombo lines having IDD access compared with only 5.0% elsewhere. It is important to note, however, that any line can receive inbound international calls.

International telephone service is available to 208 countries, and IDD is available to 138 countries. Off-peak concessionary rates are available only to those 41 countries with which SLT has direct routes. Eight of these direct routes have late evening busy-hours, coinciding with the start of the cheap rate.

Home country direct services are available to the USA (AT&T and MCI), the UK (BT and C&WC), Canada, South Korea (DACOM), Australia (Telstra), Singapore, Switzerland, Finland and Italy. In the absence of a freephone service, these are accessed through ordinary Colombo local numbers.

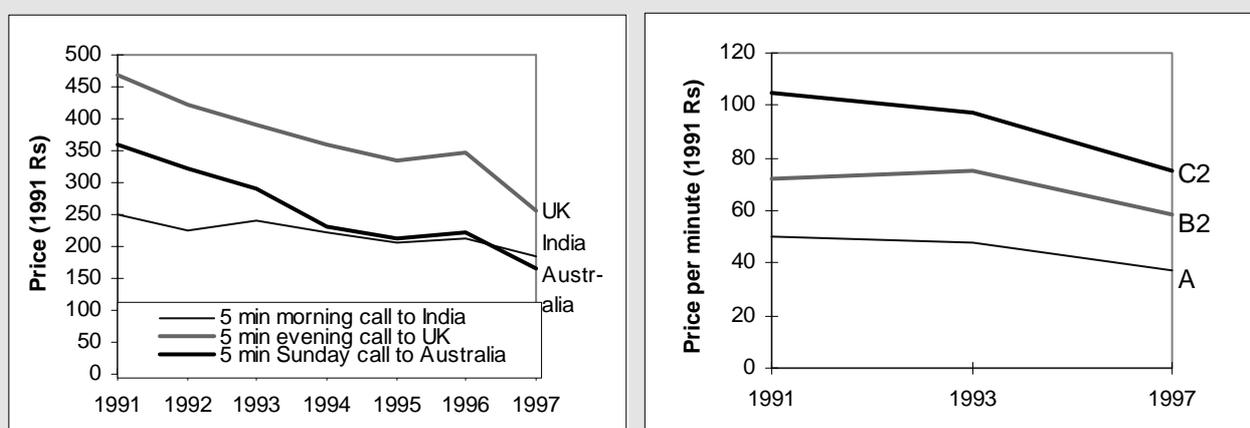
Foreign carrier credit card service is available to Australia, New Zealand, Canada, South Korea, Hong Kong, Japan, the UK and the UAE.

2.6 International telecommunication tariffs

Overall, since 1991, IDD tariffs before turnover tax have remained rather stable in nominal terms (that is, have decreased in real terms). The detail of their evolution is however complex, because of changes in country banding and discounts. Changes in turnover taxes (see above) have also affected the effective prices to end users. Figure 2.2 shows how the real prices (in constant 1991 Rs) to users of three sample calls to popular destinations have changed since 1991.

Figure 2.2: Changing prices of sample calls and selected charge bands, 1991-97

Prices are shown in constant 1991 Rupees



Note: The left chart shows sample prices for three calls made to different destinations at different times of day/week. The right chart shows the price per minute of a standard rate call in selected price bands.

Source: SLT

The changes may most easily be followed by reference to the banding that prevailed from 1993 to early 1997, when there were only three charge bands:

- Band A: SAARC countries (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan)
- Band B: Other Asia-Pacific countries (Australia, Fiji, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, Papua New Guinea, Singapore, Taiwan, Thailand)
- Band C: Rest of world

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Before 1993 and since 1997 there have been additional bands, which for the most part are subdivisions of these three simple bands, as indicated by the symbols used in Table 2.13 (e.g., Band B1 is a subdivision of Band B). However there are some exceptions to this, where individual countries have moved between bands. Rebanding has focused price reductions on the most called destinations.

In 1991, off-peak rates applied only at night (midnight to 6am), and only to those countries with which there are direct routes. Since 1993, reduced rates have been available to the same countries for longer periods, as follows:

- Standard rate: 0800 to 1800, weekdays and Saturdays
- Economy rate: 0600 to 0800 and 1800 to 2200, weekdays and Saturdays
- Discount rate: 0000 to 0600 and 2200 to 2400, weekdays and Saturdays; all day Sundays

Table 2.13A International direct dialling tariffs from 1997, including 25% turnover tax

Charge band	Standard rate (Rs per minute)	Economy rate (Rs per minute)	Discount rate (Rs per minute)
A	68.8	55.0	44.8
B1	92.5	75.0	61.3
B2	107.8	87.1	71.0
C1	118.8	95.0	77.5
C2	138.6	111.1	90.5

Table 2.13B: International direct dialling tariffs 1993-97, including 9% turnover tax

Charge band	Standard rate (Rs per minute)	Economy rate (Rs per minute)	Discount rate (Rs per minute)
A	60	48	39
B	94	76	62
C	121	97	79

Table 2.13C: International direct dialling tariffs from 1991-93 (turnover tax not applicable)

Charge band	Standard rate (Rs per minute)	Off-peak rate (Rs per minute)
A	50	30
B	72	43
C1	94	57
C2	105	63

Source: SLT

Tariffs for international voice grade leased half-circuits are also most easily understood from the 1993 structure. They were then available at prices which broke even for standard rate PSTN traffic at 21'600 minutes per year for satellite circuits and at 25'920 minutes per year for cable circuits. These prices are

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shown in Table 2.14. They have remained very similar, after a revision in late 1997. Main features of the pricing structure now are:

- Discounts are offered of 5% per additional year for long-term commitments, from 5% for two years up to a maximum of 20% for 5 years.
- Digital leased circuits are available at a range of speeds, from 1.2kbps up to 2Mbps; analogue circuits (which now attract a 25% price premium) only up to 19.2kbps.
- The price of higher speed circuits goes up less than proportionately to the capacity - for example, 2Mbps costs 12 times as much as 64kbps and provides 30 times the capacity.

Table 2.14: International 64kbps leased half-circuit tariffs in 1993, excluding turnover tax

Charge band	Satellite circuit (Rs per year)	Cable circuit (Rs per year)
A	1 296 000	1 555 200
B	2 030 400	2 436 480
C	2 613 600	3 136 320

Source: SLT

3. EVOLUTION OF THE INTERNATIONAL TELECOMMUNICATIONS ENVIRONMENT

3.1 International traffic patterns

Sri Lanka's international traffic patterns have the following key characteristics:

- **Rapid growth:** both outbound and inbound traffic streams have increased at compound annual growth rates averaging around 17% for the period since 1990, though this is now abating towards 10%.
- **Typical imbalance:** as for most developing countries, overall, inbound traffic outweighs outbound traffic by a considerable factor - recently, around 3.3. However, outbound and inbound traffic are more even in relations with other developing countries, and for some country relations Sri Lanka has greater outbound than inbound traffic. The overall ratio has remained fairly stable, at around 3.3, for some years.
- **High geographic concentration:** the top five correspondent countries account for nearly 50% of both-way traffic (with all of these five having significant shares of that 50%), the top ten correspondent countries account for 75% of both-way traffic, and the top 17 correspondent countries account for 86% of both-way traffic.
- **High line concentration:** annual outbound traffic per line has risen to around 120 minutes, well above the average for low-income countries (though low compared with many small countries). However, remembering that most lines cannot make IDD calls, the figure rises to 1'800 minutes per year per SLT IDD-enabled line, or 9 minutes per working day, which is extremely high. (This result would be a little lower if mobile and WLL lines originating international calls were taken into account).

Table 3.1 summarises the overall picture for recent years, illustrated in Figure 3.1. Unfortunately no call duration data are available for inbound calls, but if call durations into Sri Lanka from elsewhere are typical of those in the rest of the world, they would be about double outbound call durations. The inbound to outbound call ratio (as opposed to traffic ratio) would then be only around 1.6.

The top 17 countries for both-way traffic have been used for scenario analyses (chapter five), rather than the top 20, because they are the ones for which the most complete data are available. As they account for high percentage of traffic, they should give a good overall picture. Past outbound traffic streams to the top 20 countries are shown in Table 3.2. Route-specific details have little influence on the overall outcomes of these analyses. Busy hours are also shown for each route, together with an inference, where possible, on whether the busy hour is mainly business or residential traffic. (A typical timezone has been chosen for countries with more than one). It is interesting to note that six of the top 20 now have a clearly residential busy hour, coinciding with the start of evening discounts, and a further two may also be in this category. Thus a significant proportion of outbound traffic is charged at reduced rates.

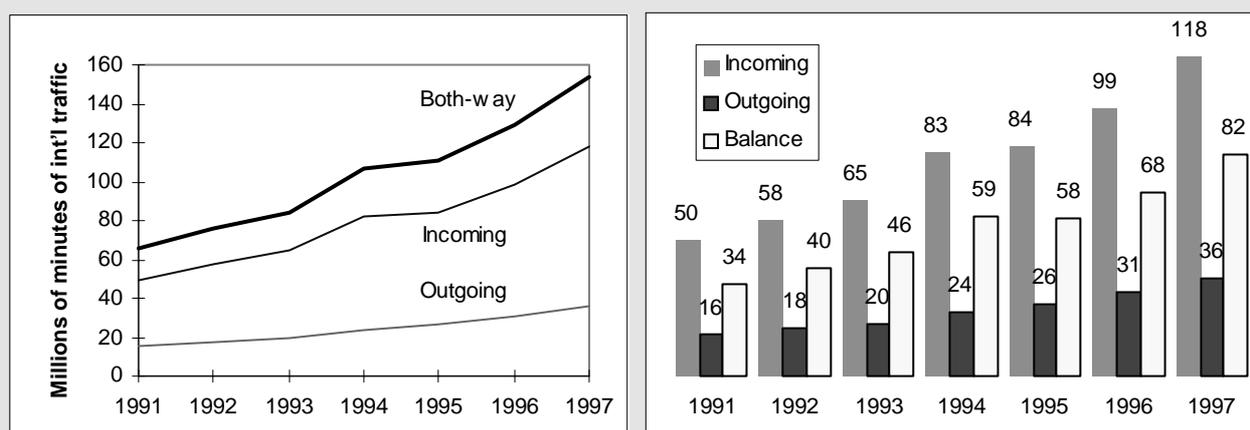
Table 3.1 International traffic and calls

	1991	1992	1993	1994	1995	1996	1997	CAGR 91-97
Traffic minutes - inbound, m	49.7	57.7	65.0	82.5	84.3	98.5	<i>117.7</i>	15.4%
Traffic minutes - outbound, m	15.6	17.8	19.5	23.8	26.2	31.0	35.9	14.9%
Traffic minutes - both-way, m	65.3	75.5	84.5	106.3	110.5	129.5	<i>153.6</i>	15.3%
Both-way % growth on previous year		15.6	11.9	25.8	4.0	17.2	<i>18.6</i>	n.a.
Inbound/outbound ratio	3.2	3.2	3.3	3.5	3.2	3.2	3.3	0.5%
Outbound calls, m	4.8	6.3	7.7	9.1	10.5	11.9	<i>14.1</i>	19.7%

Source: SLT. Figures in italics are estimated. CAGR = Compound Annual Growth Rate.

Figure 3.1: Trends in Sri-Lanka's International traffic, 1991-97

In millions of minutes



Source: SLT

SLT does not publish details of its inbound traffic streams. We can however reproduce from the ITU/TeleGeography Inc. "Direction of Traffic" database the following figures provided by other countries among the top 20 of their traffic outbound to Sri Lanka, plus the two other countries (Bahrain and Switzerland) reporting more than 1 million minutes of traffic to Sri Lanka. Only the latest year is shown. Australia, Canada, France, Italy and the Netherlands have not provided data. For comparison we show Sri Lanka's reported outbound traffic for the same year and the spot ratio of inbound to outbound traffic⁹.

A slackening of inbound traffic has been observed on several routes in the last year or two, notably from Western Europe, along with strong growth from the USA and Australia. The obvious explanation for this is refile, although no operators have been identified who will admit to this practice.

⁹ The traffic measurements supplied to this study by SLT are those used for inter-operator statements for settlement purposes. Traffic reported to the ITU as outbound often exceeds that stated to SLT as arriving on the route in question by as much as 10% to 20%. Obvious questions arise about what has been included in each set of figures.

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Table 3.2: Outbound traffic to top 20 outbound correspondents, million minutes

	Busy hour (in Colombo)	Busy hour (at far end)	Bus or res busy hour	1990	1991	1992	1993	1994	1995	1996
India	1600-1700	1500-1600	bus	1.3	1.7	1.9	2.2	3.0	4.2	4.6
UK	1600-1700	1000-1100	bus	1.7	1.8	2.2	2.2	2.5	2.9	2.9
USA	2200-2300	1000-1100		0.9	1.0	1.1	1.7	1.8	2.0	2.3
Singapore	1100-1200	1300-1400	bus	1.2	1.4	1.5	1.7	1.9	2.3	2.2
Japan	1100-1200	1500-1600	bus	1.1	1.1	1.0	1.3	1.5	1.7	1.8
Australia	1600-1700	2000-2100		0.6	0.8	0.7	0.9	1.0	1.3	1.4
Hong Kong	1100-1200	1300-1400	bus	0.8	1.0	1.0	1.3	1.4	1.5	1.4
Germany	2200-2300	1700-1800	res	0.5	0.6	0.7	0.9	1.0	1.2	1.2
UAE	1200-1300	1000-1100	bus	0.4	0.5	0.5	0.6	0.8	0.9	1.0
Korea	0900-1000	1200-1300	bus	0.3	0.4	0.5	0.6	0.9	1.0	1.0
Saudi Arabia	2200-2300	1900-2100	res	0.3	0.4	0.4	0.4	0.5	0.6	0.8
Italy	2200-2300	1700-1800	res	0.2	0.3	0.4	0.5	0.5	0.7	0.7
Canada	2200-2300	1000-1100		0.3	0.3	0.4	0.5	0.5	0.6	0.6
France	2200-2300	1700-1800	res	0.3	0.4	0.5	0.5	0.5	0.7	0.6
Pakistan	2200-2300	2100-2200	res	0.2	0.3	0.3	0.3	0.4	0.5	0.6
Maldives	1100-1200	1000-1100	bus	0.3	0.3	0.3	0.4	0.4	0.5	0.5
Malaysia	0900-1000	1100-1200	bus	0.2	0.2	0.3	0.3	0.5	0.5	0.5
Kuwait ¹⁰					0.2	0.3	0.3	0.5	0.5	0.5
Thailand	1900-2000	2000-2100	res	0.3	0.4	0.3	0.3	0.4	0.4	0.5
Netherlands	1500-1600	1000-1100	bus		0.2	0.2	0.3	0.4	0.4	0.4
Total top 20				10.9	13.3	14.5	17.2	20.4	24.4	25.5
Overall total					15.6	16.3	19.9	23.8	28.4	30.2
Top 20 as % of total					85.3	89.0	86.4	85.9	85.9	84.4

Source: SLT

¹⁰ No direct route, so no distinct busy hour

Table 3.3: Reported traffic streams inbound to Sri Lanka, and balances

Country of origin	Inbound traffic (m min)	Year	Outbound traffic (m min)	Spot ratio (in to out)
Bahrain	1.2	1995	0.2	6.0
Germany	5.7	1995	1.2	4.7
Hong Kong	1.8	1993	1.3	1.4
India	4.6	1995	4.2	1.1
Japan	5.3	1994	1.5	3.5
Korea	1.4	1994	0.9	1.6
Kuwait	0.9	1995	0.5	1.8
Maldives	0.7	1995	0.5	1.4
Malaysia	0.5	1993	0.3	1.7
Pakistan	0.4	1994	0.4	1.0
Saudi Arabia	1.8	1995	0.6	3.0
Singapore	3.0	1994	1.9	1.6
Switzerland	5.1	1994	0.4	12.7
Thailand	0.3	1995	0.4	0.7
UAE	4.9	1995	0.9	5.4
UK	10.9	1995	2.9	3.8
USA	9.0	1995	2.0	4.5

Source: ITU/TeleGeography Inc. "Direction of Traffic Database", SLT

3.2 Factors underlying international traffic patterns

The countries with which Sri Lanka has strong international telecoms links are, not surprisingly, to a considerable extent the same ones with which it has trade and tourism links, and those where there are significant expatriate Sri Lankan communities. Fifteen of the top 20 trade partners are also among the top 20 for outbound telecoms traffic, as are 16 of the top 20 tourism partners. The only countries which figure in the telecommunications top 20 but are missing from both the trade and tourism top 20s are the UAE and Kuwait, both of which have large groups of expatriate Sri Lankan workers (as of course do several others of the telecoms top 20). Only one country, Belgium, is in both the trade and tourism top 20s but missing from the telecommunications top 20. There is no obvious explanation for the lack of Belgian traffic - this analysis could be showing up a marketing opportunity.

Table 3.4 shows the distribution of expatriate remittances by world region in 1996 from the registered emigrating workforce, some 163,000 people in 1996. Although around three-quarters of workers go to three Middle Eastern countries, the vast majority of these are low-paid housemaids, so the proportion of remittances from the Middle East is under 60%. Correspondingly, one would expect housemaids to originate fewer telephone calls per head than their better-off compatriots in Europe or North America. Recently, a slackening of emigration to the Middle East has been noted, counterbalanced by an increase in demand for Sri Lankan labour from the Maldives, Singapore, Hong Kong and Italy.

- The Sri Lanka Bureau for Foreign Employment estimates that there are about 1 million Sri Lankans working abroad. Estimates of the total number of Sri Lankans overseas are unavoidably imprecise, given

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that some will settle permanently in another country and they or their children will have a new nationality, despite possibly retaining strong ties with Sri Lanka. Examination of net migration statistics over a period¹¹ however suggests that the number is well over 1'500'000. Those who have settled permanently in another country are more likely to have higher incomes, and may not only telephone Sri Lanka regularly but also fund the installation of a relative's phone line. Thus these people are probably a significant force in network growth in Sri Lanka as well as in shaping international calling patterns. They live primarily in the main English-speaking countries - the UK, USA, Canada, Australia, and New Zealand.

Table 3.5 **Distribution of expatriate remittances by world region, 1996**

World Region	%
Middle East	58
North America	7
Europe	21
East Asia	11
Australasia	1
Rest of world	3

Source: Central Bank Annual Report 1996

The balance of traffic between inbound and outbound on any given relation is not wholly predictable from simple measures, but it plainly depends on the relative prosperity of the societies at each end. As was commented earlier, Sri Lanka has a near-even balance with its correspondents at similar levels of economic development. An informal survey carried out for this study makes plain that Sri Lankans in industrial countries deliberately carry the call cost burden on behalf of their family and friends in Sri Lanka. Thus an inbound traffic imbalance is created between Sri Lanka and industrial countries with big expatriate communities, largely because of the income disparity, and almost regardless of the call prices.

Thus we see that both the volume and direction of international telecoms traffic are strongly influenced by ties of trade, tourism and expatriate communities. Lower prices and new technologies will doubtless foster growth, but it would be surprising if they brought about fundamental changes in these underlying traffic patterns.

3.3 SLT's international business in context

Table 3.6 shows the revenues which SLT derives from its international business in the context of its overall operations. The size and importance of the international business can be measured in various ways, depending on how far the relevant outgoings are netted off from the income. This study takes the view that because settlement inpayments and outpayments are linked by the settlement system, it is more meaningful to look at international revenues net of outpayments. Figure 3.2 allows a comparison of gross and net views. We see that over the last three years, net inpayments have contributed around 40% to SLT's total net revenues, and the international business as a whole around 70%.

¹¹ Source: Statistical Abstract 1996.

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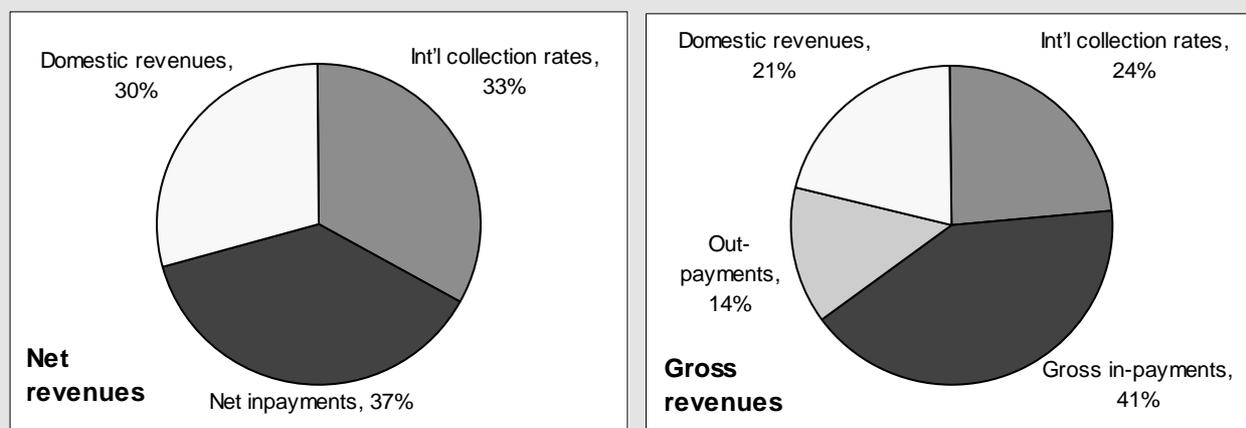
Table 3.6: SLT's international business revenues, Rs m

	1994	1995	1996
International call collection revenue	2'078	2'673	3'132
Inpayments from overseas operators	4'452	5'083	5'382
Outpayments to overseas operators	-1'921	-1'709	-1'839
Net inpayments (net of outpayments)	2'531	3'374	3'543
Net international revenues (net of outpayments)	4'609	6'047	6'675
Total SLT revenues (net of outpayments)	6'606	8'232	9'473
Net international as % of total net revenues	69.8	73.4	70.5
Net inpayments as % of net international revenues	54.9	55.8	53.1
Net inpayments as % of total net revenues	38.3	41.0	37.4

Source: SLT¹²

However the figures are viewed, there is no doubt that international traffic accounts for a substantial proportion of SLT's overall business. Chapter 4 looks at the costs of the international operation, enabling some inferences about the profitability of international traffic. We shall examine further in chapter 5 how changes in the international environment are likely to affect net inpayments and the business overall.

Figure 3.3: Revenues by source, as a percentage of SLT's total turnover



Source: SLT

3.3.1 Accounting rates

In recent years the average of the accounting rates to the top 20 countries has declined smoothly, from about US\$3.0 in 1992 to US\$2.3 in 1997, and a further fall to US\$1.8 is forecast for 1998. The only accounting rate which has been in the public domain for several years is that with the USA. This was US\$2.20 from 1990 until 1992, then fell in 1993 to US\$2.00, at which level it has since remained. The other two published

¹² Because of changes in SLT's status in 1991 and 1996, which were both accompanied by continuing improvements in accounting practices, it is not possible to derive comparable series of figures simply from the published accounts. In any case, the accounts for 1995 are not yet published and those for 1996 not yet audited. Figures quoted here in this report therefore rely on the assistance of Mr Sriyantha Fernando, Director Finance of SLT, which is gratefully acknowledged.

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settlement rates are with the UK and New Zealand. These are respectively 1.1 SDR and 1.3 SDR, or US\$1.6 and US\$1.9.

There is a rough correspondence between tariffs and accounting rates, in that the highest accounting rate for a region is higher where the tariff is higher. Correspondingly, the 1997 international tariff changes (see section 2.6) in several instances reflected lower accounting rates.

Accounting rates between SLT and its correspondents have traditionally been fixed in a series of bilateral negotiations. Because in most cases Sri Lanka receives a net inpayment, it has had no incentive to initiate rate reductions. Rather, it has responded to requests from others as and when these have arisen. For any given country, renegotiations are at most annual, and in some cases there has been no move to change rates for several years. Sri Lanka may be benefiting here from its small size, which means it is among few countries' top 20 outgoing correspondents - it is number 15 for India, and number 20 for Kuwait and Singapore - thus relatively low among other negotiators' priorities.

SLT has explained its negotiating position on the following lines:

- Recognising the risk of refile, it aims to bunch rates for relations with a given region close together, while maintaining the lowest level. Thus it is likely to agree to rate reductions that are requested so long as the result is still above the minimum level for the region in question, and so long as traffic forecasts indicate that the overall level of net inpayment from that country will be maintained (or if the net inpayment is very small in any case).
- Both parties are obviously aware where the settlements are used for loan repayments, and will take care to keep them high enough to cover this requirement.
- It agrees to reductions on condition that these are reflected in end user prices for calls to Sri Lanka in the correspondent country, in the expectation that this will to some extent stimulate inbound traffic.
- There is some scope for transit traffic to enter the negotiations in a "package deal".
- When refusing requests for reductions, it gives reasons; normally this position is then accepted.
- To date, it has turned down suggestions of profiting from refile or international audiotex, regarding both as less than sound business practices.
- One suggestion for an asymmetrically divided accounting rate (40/60) was turned down because it was tied to reducing a rate that was already seen as too low.

3.4 Price elasticity of demand for international calls

The price elasticity of demand for outbound international calls is a key element in considering the effects of the various scenarios. Unfortunately, only limited relevant data are available. This section summarises these data and then explains the assumptions that will be used in our modelling.

We divide international phone calls into three categories:

- business calls. Business users are fairly price-insensitive and in general are already making those calls that they consider necessary. At any given moment, price cuts would have to be quite large to stimulate significant new calling, such as the replacement of previously mailed letters by faxed ones.
- essential personal calls. These are likely to be infrequent (typical content being "please meet my flight" or "come home at once, Father is very ill"). Because they are seen as essential, users will be price-insensitive.
- discretionary personal calls. These are typically for keeping in touch with family and friends, could be replaced by a letter, and in principle could be long and frequent if they were cheap enough. This is the category where users are price-sensitive. It could amount to a large market at the right price.

3.4.1 Direct evidence

SLT and its correspondents have initiated various, mainly short, price promotions for international traffic, which give some indication of price elasticity for both outbound and inbound calls. Some recent examples are given below.

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SLT had a one week promotional campaign to three industrialised countries among its top 20 correspondents in mid-1997. A discount of 20% was offered to all three destinations. The outcome is shown in Table 3.7.

Table 3.7: International price promotion outcome

	Traffic increase (%)	Collection change (%)
Country 1	6.6	-14.3
Country 2	8.6	-13.1
Country 3	12.7	-9.8

Source: SLT

- A Western European correspondent had a well-publicised two-week special offer for calls to Sri Lanka in early 1997. The price reduction was 33 % in normal time, and 44 % nights and Sundays. The outcome was an increase of 62 % in traffic. The net result in the Public Telecommunication Operator's (PTO) collection cannot be calculated, as the division of call minutes between the two tariffs is not known; however, assuming that the effective tariff reduction is the average of the two tariffs (38.5 %), the impact on collection revenue would be neutral, down only 0.4 %. Any higher discount would have led to a loss in collection revenue. A traffic profile showed that some 38 % (compared to the normal 35 %) of the campaign traffic was on the three Sundays during the campaign, indicating a significant amount of residential callers. The average increase in Sunday traffic was some 72 %. The two week campaign traffic was some 9 minutes per Sri Lankan person registered in that country.
- Another industrialised correspondent had a weekend campaign in the summer of 1997. The promotion was "every third minute free", resulting in a theoretical discount of 33 %, in practice somewhat less. The result was a 19.9 % traffic increase. Thus total collection revenue was down by somewhere in the region of 10%.
- An informal survey carried out for this study among SLNet members in various countries further supports the idea that for existing market segments, if prices fall, traffic will rise, but revenues will be relatively stable. However it is important to remember that lower prices may bring in whole new market segments.

3.4.2 Indirect evidence

- Published information on price elasticities of demand for international calls is in short supply. We quote here results from the best source we have found¹³.

3.4.3 Implications for Sri Lanka

In applying these observations of the last but one section to Sri Lanka, it is important to remember that in today's industrialised countries, high line penetration preceded affordable international telephony by decades. In today's developing countries, line penetration and affordable international telephony are growing hand-in-hand. This suggests that Sri Lanka may move faster into the high price elasticity phase than its industrial predecessors have done - some non-subscribers may make international calls and a proportion of new subscribers may get lines with international use specifically in mind. However, at present it is still clearly in the early, low elasticity phase.

The major limiting factor on outbound international calling from Sri Lanka at present is not in itself the high level of call charges, but limited access to lines open for IDD. Because of the risk that IDD entails of running up high (possibly unauthorised) bills, SLT's current policy is to require a large deposit to protect itself from (usually fraudulent) bad debt. This naturally limits IDD access to those with a high and regular

¹³ David Cracknell, BT: *The demand for international telephone calls - the dynamics of price elasticity*, ITS Regional Meeting in Leuven, August 1997.

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need for it. An alternative approach, such as user-specified credit limits, could widen the market to many more existing subscribers who might make only occasional international calls. We understand that SLT is indeed planning to adopt some such approach fairly soon. Some of these calls would substitute for calls already being made through agencies, payphones, and other people's lines, but overall a significant increase should be expected.

Longer term, the market for international calling will undoubtedly expand much further. Much lower international call charges will have an important part to play in encouraging discretionary personal calling, and in stimulating the expansion of businesses which depend on international calling. But both these changes depend critically on overall system expansion so that lines are available, and on growth in use of the phone for all purposes. Here we must be speaking of a five to ten year timescale for significant change. It is unrealistic to expect an occasional user to make many international calls before he or she is already in the habit of making national calls.

We conclude that:

- short term, there is little incentive for SLT to make large cuts in international call charges. To increase outbound international calls, a much more fruitful action would be to make IDD accessible to occasional callers.
- long term, a much larger market for outbound international calls can be foreseen at much lower prices. This can only develop gradually in a balanced way, along with the underlying market for access and the parallel market for national calls.
- a sensible commercial strategy for SLT would be to lower international call charges regularly and gradually, in order to achieve competitive price levels around the time when a new international competitor arrives (2003). It will need to consider the relative merits of later and earlier achievement of the main price cuts: later means maximum immediate revenue retention, while earlier, by signalling what is on the way, may enable the eventual benefits (such as attracting multinational businesses to locate branches Sri Lanka) to begin to be realised sooner.

In the absence of firm plans by SLT, and recognising that both earlier and later price cuts have their merits, our modelling assumes that the cuts will be spread evenly over the 5-year adjustment period.

3.5 Prospects for international competition

For the time being SLT enjoys a formal monopoly on international voice telecommunications in Sri Lanka. This is expressed through the following regulations:

- SLT is the sole licensee for international voice services;
- international private leased circuits may not be used for voice;
- international private leased circuits may not be connected to the PSTN at either end (or indeed shared by employees of more than one organisation or on more than one site).

This means that Internet service providers may legally use their international connections (whether leased circuits or packet switching) for data only. It is arguable that voice over the Internet would be in breach of the monopoly, but as it is indistinguishable from other Internet traffic this would be very hard to police. (PSTN breakout from leased circuits is also technically possible and could not be detected without site inspections). Low-priced voice over the Internet (particularly of the kind that is possible between two simple telephones, with no computer needed on customers' premises) may well be the first test of the monopoly policy. Should it arrive and make significant inroads into the market, SLT could reasonably be expected to simultaneously challenge its legality and offer a competing service itself. In any case, voice over the Internet will exert downward pressure on tariffs.

The provision of international infrastructure in competition with SLT is not ruled out, so long as services using that infrastructure do not include voice telephony. At present the only other company actually providing its own international infrastructure is **CeyCom**, the VSAT company (a joint venture between the local company Ceylinco and Hughes). Because of its relatively low cost of deployment, VSAT technology offers obvious scope for newcomers to address the international market.

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Call-back is not illegal in Sri Lanka. It is known to have been marketed to businesses by fax mailshots. Most advertised prices are somewhat (but not dramatically) lower than SLT's, with the biggest reductions being on calls to the USA. No systematic attempt has been made to measure its success, but it is not thought to account for more than a small percentage of the market. Because the collection rate is close to the accounting rate on the US route, the overall revenue effect of US-based call-back on SLT is roughly neutral, and it has made no attempt to oppose the phenomenon.

Already interconnected operators are providing significant contributions to SLT's international traffic, as is shown in Table 3.8. (In principle payphones should be included in this table, but the figures are negligible). Of course the WLL operators were just starting in 1997, and considerable growth may be expected here. The lack of contribution from WLL operators to SLT's domestic revenues follows from the sender-keeps-all interconnect arrangement. Outbound calls from mobiles are particularly expensive because the operators have to charge the full SLT price plus their own margin (see Table 2.10), so there is a special incentive for call-back here.

Table 3.8 Percentages of SLT's revenues billed to interconnected operators

	International 1996	International 1997 (Jan-Nov)	Domestic 1996	Domestic 1997 (Jan-Nov)
Cellular	10.3 %	10.0 %	3.7 %	4.2 %
WLL	-	3.5 %	-	-

Source: SLT

In the WTO negotiations in early 1997, the prospect was held out that a second international operator would be licensed in Sri Lanka in the year 2000. However, as part of the privatisation deal negotiated during the summer of 1997 between the Government and NTT, this date was postponed until 2002. (More precisely, a second operator may not be licensed until NTT have had five years' monopoly, that is not before August 2002; so a new competitor could hardly start operations before the beginning of 2003). In addition, it is currently planned that there will be only the two competitors for a further five years.

However, the status of these two plans is different. The undertaking of five years' initial monopoly is a legally binding commitment by the Government, and must be respected, unless of course NTT were to wish otherwise. (This possibility, while it may currently seem unlikely, cannot be ruled out - for example, Hong Kong Telecommunications has recently voluntarily given up its international monopoly, in return for a substantial compensation payment. NTT's desire to compete in other markets may also become sufficiently pressing for it to see reciprocal competition in Sri Lanka as worthwhile.)

The second five years' duopoly is more of a statement of intent, and is subject to SLT's satisfactory performance during the first 5 years. If SLT were to fall down in achieving its network expansion or quality targets, the Government could be justified in licensing more competitors. Relevant failures could also include problems in the quantity or quality of interconnect.

In spite of the formal monopoly, Band X, the UK spot market for minutes and bandwidth, includes trading of links with Sri Lanka. Early in this study a request was registered on Band X for 100'000 to 2'000'000 minutes from the USA to Sri Lanka, by a buyer willing to offer US\$ 0.70 a minute. At the same time 10'000 to 100'000 minutes were on offer at US\$ 0.59 a minute. Both prices are well below the settlement rate of US\$ 1.00 a minute. The most obvious interpretation of these facts is that resale of leased circuit capacity is taking place.

4. COST EVALUATION OF INTERNATIONAL TELECOMMUNICATION SERVICES

4.1 Information on SLT's costs

As explained below, SLT is not yet in a position to apportion its costs among services, or indeed to know all of its costs with full assurance. This section provides such base data as the study has been able to gather, which will be used below to make rough estimates of the fully allocated costs of international service.

Table 4.1: SLT staffing

	1991	1992	1993	1994	1995	1996
Lines (k)	125.8	135.5	157.8	180.7	204.3	254.5
Staff	7'141	7'572	7'466	7'500	8'150	10'340
Lines/staff ratio	17.6	17.9	21.1	24.1	25.1	24.6

Source: SLT

The ratio of lines to staff is low by international standards. This is not surprising, for a company that until 1991 was a government department and is still in the early stages of growth. On the positive side, this situation offers opportunities for cost reduction (though it must be noted that wages are relatively low, and may need to rise to retain good people in the increasingly competitive environment).

Table 4.2: SLT's operating revenues and costs, Rs m

	1994	1995	1996
Total operating revenues	8'527	9'941	11'312
Total operating costs	4'690	6'038	6'349
of which: international outpayments	1'921	1'709	1'839
and other operating costs	2'769	4'329	4'510
of which: staff costs	968	1'074	1'249
and depreciation	869	1'138	1'383
and travel/financial/administration	193	707	633
and other costs	739	1'410	1'245
Gross profit	3'861	2'796	3'618
Interest	505	417	748
Tax	2'059	721	96
Levy	-	1'000	750
Net profit after interest, tax and levy	1'297	658	2'024
Turnover tax (see note)	881	881	1'550

Note: Turnover tax excluded from revenues, shown for purpose of comparison
Source: SLT.

The particular categories of cost that are identified in Table 4.2 are those that were requested for all Case Studies. SLT's accounts identify many other cost categories (e.g., maintenance, transport, buildings) and indeed go down to a considerable level of detail within several of these cost categories (e.g., fuel, office

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equipment). What they do not do (and neither, as yet, do SLT's internal procedures) is to permit separation by service (e.g., international vs. domestic) of the major cost items.

A few cost items in the accounts identifiably relate wholly or mainly to international operations. These are shown below. (1996 figures at this level of detail are not yet available).

Table 4.3 Specific international cost items from SLT accounts, Rs m

	1992	1993	1994	1995
Cable operating and maintenance cost	175	135	216	165
Satellite utilisation		67	72	112
Depreciation - international telecom plant	31	44	48	125
Depreciation - investment in SEA-ME-WE 1	39	39		
Earth station commissioning				2

Source: SLT accounts

Fixed assets are more readily identified as international or domestic, at least in earlier accounts. The relevant figures from the accounts are shown below.

Table 4.4: SLT asset base, Rs m

	1991	1992	1993	1994	1995	1996
Total fixed assets	7'178	6'880	7'818	7'745	10'742	18'456
International fixed assets	174	145	314	300	1'229	
International as % total (fixed assets)	2.4	2.1	4.0	3.9	11.4	
Total work in progress	115	1'419	2'892	7'961	10'121	13'967
International work in progress	81	945	898	100	28	
Total investments	901	924	857	2'182	2'007	618
International investments	901	924	857	2'157	1'982	
Total (fixed assets+WIP+investments)	8'194	9'223	11'567	17'888	22'870	33'041
Total international (FA+WIP+inv)	1'156	2'014	2'069	2'557	3'239	
International as % total (FA+WIP+inv)	14.1	21.8	17.9	14.3	14.2	
Fixed assets + WIP	7'293	8'299	10'710	15'706	20'863	32'423
International fixed assets +WIP	255	1'090	1'212	400	1'257	
International as % total (FA + WIP)	3.5	13.1	11.3	2.5	6.0	

Source: SLT accounts

SLT's main domestic revenues are also presented below for purposes of comparison. The split of the single item "domestic rentals and call charges" has been estimated on the following basis:

- rentals estimated by average lines for the year times the annual rental;

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- call charges assumed split 60% local, 40% trunk (based on an assumption that 80% of calls are local, which seems reasonable on the basis of experience elsewhere and given the high proportion of phones in a single local area, namely Colombo).

Table 4.5: SLT domestic revenues, Rs b (including turnover tax)

	1994	1995
Domestic rentals and call charges	2'077	2'362
of which (est) rental	200	230
and (est) local call charges	1'126	1'279
and (est) trunk call charges	751	853
Connection charges	472	414
Leased circuit revenue	64	58

Source: SLT accounts, Case Study estimates

4.2 Cost estimates for SLT's international services

SLT is developing its accounting systems to enable costs by service to be produced as quickly as possible, not least in order to get new cost-based interconnect charging arrangements. (As was pointed out above, the existing arrangements are biased in favour of the new operators, partly for simplicity in the absence of hard cost data, and partly to put pressure on SLT to produce these data). We can therefore only attempt a variety of indirect estimates using such relevant information as is available.

FCC methodology

The FCC's Tariffed Components Prices study did not cover Sri Lanka. The "costing" methodology employed has been widely criticised, not least because it is mainly based on tariffs rather than costs. We agree with these criticisms. Nonetheless, as it was not done by the FCC, we have tried applying the FCC methodology to Sri Lanka. Looking separately at the three components, we find:

- **International transmission:** using the lowest available international leased circuit price (ie 2 Mbit/s satellite transmission to a Band A country with a 5-year commitment), and all other assumptions as made by the FCC (ie a 4:1 voice channel multiplication factor and 8'000 minutes a month transmitted per voice channel), we obtain a result per minute of 1.08 Rs or 1.8 US cents. The corresponding figures for Band C countries are exactly double, i.e., 2.16 Rs or 3.6 US cents. We are unable to say whether or not the arbitrary factor of four introduced into this calculation has any relevance in the Sri Lankan context.
- **International switching:** here the methodology simply gives a choice among three "cost bands" based on a country's GDP per head. The GDP per head is a proxy for the degree of network digitalisation. Using the actual prevalence of digital switching rather than that pointed to by the GDP per head, we obtain a result of 1.9 US cents or 1.14 Rs.
- **National extension:** a rough current price per minute for domestic calls is in the region of 1 to 1.5 Rs (1.7 to 2.5 US cents) per minute. The need for rebalancing of domestic tariffs is well recognised.

The sum of these components ranges from 3.2 to 4.8 Rs (5.3 to 8 US cents) a minute.

Top-down apportionment of SLT costs

Because of the lack of detailed cost data we do not attempt a bottom-up estimate. A rough top-down cost apportionment is however possible using the figures supplied above. The results are of course indicative of fully-allocated rather than incremental costs.

From the various percentages shown in Table 4.5, and from comparison of the total and international depreciation figures in Tables 4.2 and 4.3, we see that the international proportion of SLT's capital base

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varies from time to time and according to the particular measure used. It seems however to be focused on the range 5% to 15%. We may therefore estimate the specific running costs of the international operation as a percentage in this range of SLT's total operating costs¹⁴.

The remaining costs are presumed to be those of the domestic operation. International must also bear its share of this (the national extension cost). Unfortunately there are no comparable measures of international and domestic traffic. However, from various sources we can estimate domestic charged minutes^{15 16}. Domestic calls of course (apart from a small minority of interconnected calls) both originate and terminate on SLT's network, whereas international calls do one or the other.

Table 4.6 shows the resulting cost estimates per minute of international traffic and, incidentally, also for national traffic (assuming all costs are allocated to calls - no allowance is made for non-traffic sensitive costs or charges). Interest and the government levy are added to operating costs as an indicator of cost of capital (the levy may be regarded as the Government's return on capital employed).

Table 4.6 Per minute call cost estimates

	1994	1995	1996
Total costs (operating costs plus interest and levy), Rs m	5'195	7'455	7'847
International minutes, m	106	110	130
National minutes (est), m	1'800	2'200	3'000
International extension as % of national costs	2.9	2.5	2.2
International dedicated costs at 5% of total, Rs m	260	373	392
International dedicated costs at 10% of total, Rs m	520	746	785
International dedicated costs at 15% of total, Rs m	779	1'118	1'177
International extension costs, 5% basis, Rs m	145	177	162
International extension costs, 10% basis, Rs m	138	168	153
International extension costs, 15% basis, Rs m	130	158	145
International call costs/min, 5% basis, Rs	3.8	5.0	4.3
International call costs/min, 10% basis, Rs	6.2	8.3	7.2
International call costs/min, 15% basis, Rs	8.6	11.6	10.2

Source: SLT, Case Study estimates

Given that the national network and national traffic are growing even faster than international, we would expect the international proportion of total costs to be gradually falling (as of course should operating costs per minute). On the other hand, with the privatisation one would expect the cost of capital to rise - soft loans will dry up and shareholders will demand commercial levels of dividend. This estimation approach

¹⁴ This assumes that the operating cost per unit of asset base is similar for the domestic and international sides of SLT's business. A more refined approach would of course differentiate these figures, but we have no basis for deviating from the simple assumption.

¹⁵ More accurate estimates would take account of the differing network quality required by international and domestic calling; however our estimates are too rough to sustain such refinements.

¹⁶ Our estimate of domestic charged minutes should be adequate for the current purpose, that is, to estimate a component of international costs. However it is not accurate enough to use in estimating national call costs per call minute.

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therefore suggests a “best guess” cost for international traffic of somewhere in the range 8 to 10 Rs per minute¹⁷ (13 to 17 US cents).

The estimates are based on figures that are themselves estimates. It is clear from the method that the input to which the result is most sensitive is the proportion of SLT’s costs which are international, which we have shown in the table above as varying from 5% to 15%. The result varies almost proportionately. However, we can say with some confidence that its value is no greater than 20%. This allows us with the same confidence to fix a cost ceiling of around 20 Rs (33 US cents) per minute.

In some countries it is argued¹⁸ that high transit charges drive up the overall cost of international operations. Sri Lanka, however, generates enough traffic to route more than 90% of its traffic over direct routes, so transit charges for the remaining portion, however inflated, cannot have much effect on overall costs.

In view of the highly approximate nature of these various approaches, in our modelling work we use a range of possible costs per minute.

¹⁷ A more refined approach would also distinguish between the costs of originating and terminating international calls. Clearly, we are in no position to do this. However, the main differences should be found in the marketing, billing and bad debt costs associated with originating calls, from which terminating calls are relatively free (late payment and bad debt being rare, though not unknown, for international settlements). We would therefore expect the cost per minute of originating international calls to be somewhat higher than that of terminating international calls.

¹⁸ See, for example, ITU/TeleGeography Inc. *Direction of Traffic, 1996*, Box 2.2: The cost of transit.

5. SCENARIOS FOR CHANGE IN THE INTERNATIONAL ACCOUNTING SYSTEM

In this chapter and the next, we consider the effects on Sri Lanka of changes in the international environment. Over the five year period for the Case Study, because of the decision to retain an international monopoly for this period, this largely means the effects on SLT, though competing access operators also have a part to play in terminating and originating international calls (and will benefit through interconnection payments). The industry structure that the Government of Sri Lanka (GoSL) has chosen for this period means that relatively high international tariffs are the price to be paid for rapid progress in the domestic network (and of course for the government's proceeds from privatisation).

It could be argued that customers would have benefited more from faster international liberalisation. Indeed, when the option arises of introducing more international competition, this point of view will doubtless be taken into account. However, for the purpose of this study, we have to respect GoSL decisions and commitments - which are similar to those in many other countries, and more liberal than those in many others.

5.1 Immediate effects on Sri Lanka of the changing international environment

5.1.1 The five scenarios

In this section we describe the five scenarios that the ITU asked us to investigate and summarise the main financial effects that they seem most likely to have on SLT. We postpone to section 5.2.1 below our full discussion of actions which SLT may take in reaction to them.

The modelling uses as data inputs the traffic flows between Sri Lanka and its top 17 partners, together with actual 1997 accounting rates and outbound tariffs for these relations. All our modelling uses the following central assumptions. We have also tested the effects of a wide range of different assumptions, and comment if these lead to significantly different outcomes.

- On all routes and in both directions, traffic continues to grow linearly at the same rates that have been displayed since 1990 (i.e., best-fit straight-line projections of the period 1990 - 1997 are used). This assumption could easily prove to be over-optimistic, in which case all revenue projections would have to be reduced.
- Inbound refile opportunities are assumed to be taken up by all correspondent operators to the extent of 5% in the first year, 10% in the second year, and so on. (These percentages would probably be more appropriate to the more aggressive operators, so this is a somewhat pessimistic assumption). Refiled traffic is also pessimistically assumed to be settled at the lowest prevailing settlement rate.
- Reverse calling opportunities (that is, call-back, country direct and calling-card services) are also assumed to be taken up to a similar extent. It is assumed that the effect of a reversed call on SLT's finances is the loss of the margin between the collection charge and the outbound settlement charge, combined with the gain of the inbound settlement charge. This may be an oversimplification.
- As discussed in 3.4, we assume a gradual (5% per year) decrease in SLT's international tariffs. As is explained elsewhere in this report, tariffs could have to fall faster than this, in which case, again, the corresponding revenues (collections) would be reduced.

By "international revenues" we mean the sum of net inpayments and collection revenues.

Scenario A: FCC benchmarks

This scenario is designed to model the effects of a widespread adoption of the Federal Communications Commission (FCC) proposals for "benchmark" accounting rates. In the case of Sri Lanka, this means achieving the benchmark level of a 23 cent settlement rate in 5 years. Equal annual percentage reductions are required, which means a 25.4% annual reduction. This is applied to all accounting rates between Sri Lanka and elsewhere.

- The most obvious, and dramatic, effect of this scenario is a large drop in SLT's net settlement revenue - from 72m US\$ in 1997 down to 25m US\$ in 2002.
- This fall is very partly offset by a rise in collections revenue from 37m US\$ in 1997 to 41m in 2002.

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- The maximum effect of inbound refile is a further inpayment reduction of 3m US\$. (This occurs before the end of the period, because the rising percentage takeup of refile opportunities is counterbalanced by reduced scope for refile as settlement rates converge).
- The maximum effect of reverse calling is a further revenue reduction of 7m US\$. (The effect is initially positive but becomes negative and continues to grow in size).

Overall, we see SLT's international income nearly halved - from 109m US\$ down to 56m US\$ - despite healthy continuing traffic growth.

Table 5.1: SLT's international revenue components under Scenario A - US\$m

	1997	1998	1999	2000	2001	2002
Collections	37	38	41	41	41	41
Net inpayment	72	61	49	40	31	25
Refile adjustment	-2	-2	-3	-3	-3	-3
Reverse flow adjustment	1	0	-1	-3	-5	-7
Total	109	97	86	75	65	56

Source: Case Study Analysis.

Scenario B: staged reductions

In this scenario, as in the previous one, all accounting rates are assumed to reduce together at the same rate. However reductions are taken linearly rather than in percentage terms, i.e., as 10%, 20% etc reductions on the base year levels. Two variants were tested: 10% and 6% annual decrements.

As would be expected, the results from these calculations are similar in kind to those from scenario A, but with the degree moderated by the lower rates of changes. The linear application of decrements also delays effects compared with the equivalent decrement applied in equal annual percentages.

Specific effects include:

- with the 10% decrement, net inpayments fall by only one-third to 54 m US\$, and with the 6% decrement they remain very steady (i.e., growth offsets the fall in inpayment per minute)
- in either case, collections revenue increases modestly as in scenario A
- the maximum effects of inbound refile are of course greater than in scenario A, rising to a negative 7 m US\$ for the 10% decrement and 9 m for the 6% decrement.
- the reverse flow adjustment remains relatively small, rising to a maximum of 3 m US\$ in the 6% case.

Overall, international revenue falls from 109m US\$ in 1997 to 88m in 2002 with the 10% decrement, and rises to 111 US\$ with the 6% decrement.

Scenario C: asymmetric settlements

In Scenarios A and B, it was assumed that settlement rates would continue to be equal at both ends of any given relation. Scenario C looks at some new possibilities opened up by asymmetric settlements.

(i) country-set termination rates

This scenario calls for a phased move towards call termination charges, which are assumed to be set by each operator offering international call termination services, and to be the same for all comers to each country (but different for different countries). Where international call termination is offered competitively, these termination charges will naturally tend towards cost, plus if required a subsidy element presumably set by the regulator. Subsidy policy in Sri Lanka is set by the minister on the recommendation of the regulator. We model two ways of approaching the goal:

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1. We set assumed termination charges at the end of the 5-year transition period, and move from existing rates towards these end points in equal annual decrements for each correspondent. This means that the rates converge gradually.
2. We move directly to uniform termination charges for all comers and then reduce them annually all together in equal decrements. The rates are calculated to achieve the same end result as above.
 - The obvious effect of the endpoint of this scenario is the disappearance of refile, since termination charges are the same for all comers. The disappearance is immediate in version 2 (“fixed”), which otherwise has the same results and so is not shown separately.
 - The reverse flow adjustment remains negative and relatively small (maximum 10 m US\$). In this scenario the possibility of reverse call-back also enters, which could turn this adjustment into positive revenues for SLT. We discuss this further below.
 - Again, collection revenues rise gently as in the previous scenarios.
 - Net inpayments fall by amounts which depend on the termination rate chosen by SLT. The overall international revenues achieved are 62m US\$ for a 20 ¢ rate and 96 m US\$ for a 40 ¢ rate.

(ii) unevenly split accounting rates

In this scenario, accounting rates are as in scenario A above, but they move from the current 50:50 split towards a 40:60 split in favour of Sri Lanka. Again the phasing is linear, ie Sri Lanka’s share increases by 2 percentage points each year.

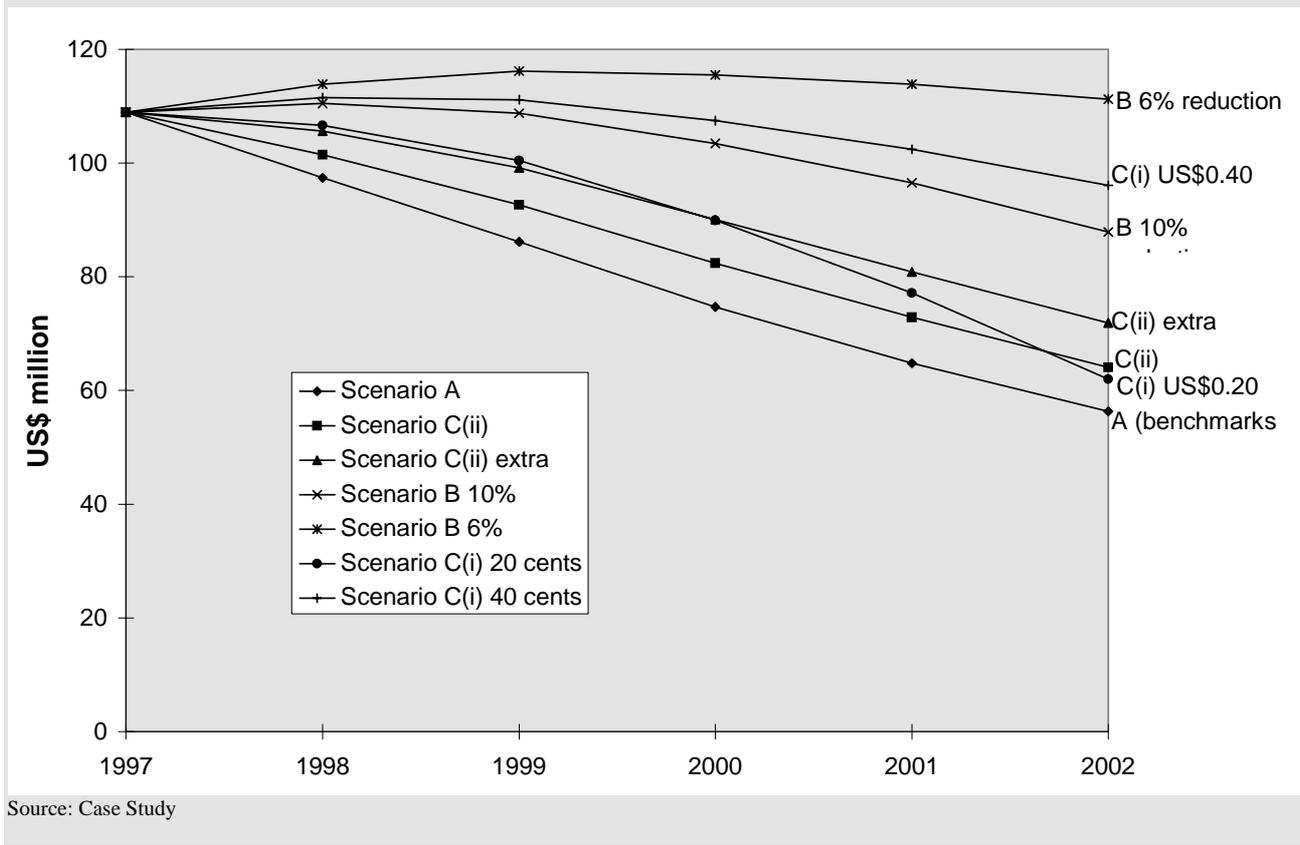
- As would be expected, the effect of this scenario is similar to that of scenario A, on which it is a variant. The net inpayment fall is however somewhat moderated, from the 48 m US\$ loss experienced under the original scenario A to 39 m here.
- A greater degree of asymmetry was also modelled (a 4% annual change in place of 2%, leading to a final split of 30:70 in favour of Sri Lanka). This further reduces the net inpayment loss, this time to 30 m US\$. (This is shown as “scenario C(ii) extra” in Figure 5.1).
- Again in this scenario, reverse calling could bring in some positive revenues.

Figure 5.1 shows the total international revenues under the variant scenarios discussed so far, and Table 5.2 shows the revenue components at 2002. (The “fixed” variant of C (i) has the same result in 2002 as the main C (I) - the only real difference is the immediate disappearance of refile).

Table 5.2 International revenue components in 2002 under Scenarios A to C, US\$m

Scenario	A	B 10%	B 6%	C (i) 20 ¢	C (i) 40 ¢	C (ii) 0.02	C (ii) 0.04
Collections	41	41	41	41	41	41	41
Net inpayment	25	54	76	29	60	33	42
Refile adjustment	-3	-7	-9	0	0	-4	-4
Reverse flow adjustment	-7	-1	3	-8	-5	-7	-7
Total	56	88	111	62	96	63	72

Source: Case Study

Figure 5.1: SLT's total international revenues under scenarios A to C

Scenario D: very low termination rates/sender-keeps-all

This scenario can be seen as the limiting case of scenario c(i) - where termination charges have become so low that it is no longer economic to assess and collect them. (This will obviously occur earlier on routes with well balanced traffic). The “sender keeps all” scenario is then attained.

This arrangement is particularly attractive where a single PTO operates at both ends of a route. However, as explained elsewhere in this chapter, we do not see this as a likely or sensible business choice for SLT within the next five years. For this period, its priorities are properly domestic.

This scenario may well be acceptable in markets, such as Europe, where traffic flows are fairly well balanced between countries. For Sri Lanka, however, because of the structural nature of traffic imbalances, we do not see this scenario as realistic within the five year study period. The international business must generate revenues to cover its costs, and it cannot be fair or efficient to load all cost recovery onto the 20-25% of traffic which is outbound. This would lead to further pressure on users to reverse traffic flows and a downward spiral in SLT's international revenues.

In conclusion, we do not see this scenario as one to which Sri Lanka could be a willing party. If forced into it, SLT would naturally lose interest in stimulating inbound traffic or in augmenting routes to handle inbound traffic increases.

Scenario E: revenue stabilisation

This scenario calls for explicit compensation from international sources to low teledensity, low income countries for shortfalls in their net inpayment revenue in order to protect network expansion plans. Various alternative approaches to revenue stabilisation may be envisaged, including:

- The proposal by the TAF regional tariff group for Africa, along the lines suggested in a footnote to the record of their May 1997 meeting (i.e., essentially that any shortfall in required net inpayments be made good by splitting the accounting rate asymmetrically, in favour of the lower teledensity country);

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- The recent contribution by Trinidad and Tobago on termination rates with any desired subsidy component;
- Sliding-scale contributions by high teledensity countries to a network development fund, drawn on by low teledensity countries according to agreed criteria, related more closely to investment needs than to international traffic. This could be an extension of the functions of existing financing organisations like WorldTel.

Such measures could be applied in parallel with any of scenarios A to C. However any arrangements of this kind will need a longer lifetime than is being considered for the transitional arrangements for settlements. Many more years will be needed to raise teledensity to desired levels than are available for reorganising international settlements.

Attractive though they may seem at first glance, the relevance of these arrangements to Sri Lanka is limited by its new commercial status. The third option in particular would be unlikely to benefit Sri Lanka: SLT under its new management has already raised large loans and would have difficulty putting a case for preferential treatment to an international funding body. In addition, to ensure fair competition, any funding would have to be shared by all local access operators.

The first option, namely the TAF proposal, may be seen as a variant of scenario C(ii). It assumes willingness of the party at the far end to agree to a sharing of a pre-determined accounting rate which may leave it with a very small amount. It seems more likely that both parties would prefer a higher rate which could be shared in such a way as to provide each end with its required level of settlement. In other words, it is not clear that this arrangement has any advantage over the second proposal (for flexible termination rates), to which it would tend to become equivalent.

The second option, for flexible termination rates, has already been discussed above. Assuming that the subsidy element was approved by the national regulator, and identical for all competing operators, it seems a sensible and sustainable option which could benefit Sri Lanka as well as many other countries. It would be important, however, for the regulator to clarify which operations were proper recipients of cross-subsidy from international termination rates.

5.1.2 Overview of results from scenario modelling

Our results from the scenario modelling may be described at the top level as follows.

- By far the most significant variable is the overall level of inbound settlement rate. If this falls then net inpayments fall too, with a major effect on SLT's income stream.
- Refile or its absence, and reverse flow adjustments, may all play a part in moderating the revenue shortfalls, but the maximum they can achieve is limited (typically to less than a third of the loss).

5.2 How Sri Lanka may react to the immediate effects

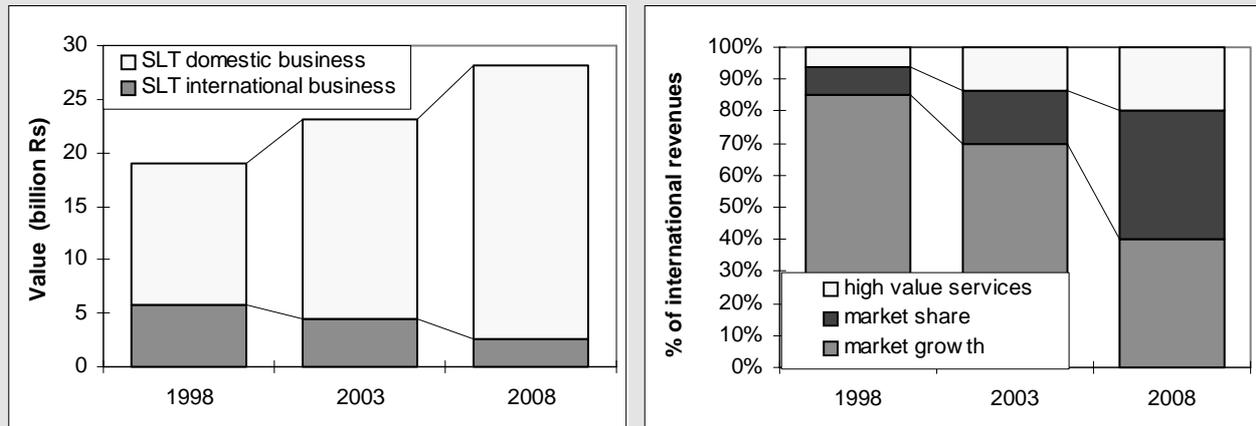
Because of the international monopoly that it has been granted until 2002, the reactions that we discuss in this section are largely those of SLT. However, later in the section we look at possible reactions to some scenarios by other players, notably the regulator. SLT's actions are divided into two groups:

- those that it is already planning anyway, driven by broad commercial imperatives coupled with a general expectation of a fall in accounting rates;
- other specific actions which it may consider to handle particular situations.

5.2.1 Actions that SLT is planning anyway

SLT had already adopted a focused approach to its main challenges before the partial privatisation, and the new management is giving further strength and support to specialised project teams. It is of course understood that the international business will fall as a proportion of the total, but the plan is to achieve this while continuing to grow international business volume and as far as possible maintaining total international revenues in the face of falling unit values. In 1998 international is expected to fall below 50% of total revenues for the first time (see Figure 5.2). The following paragraphs describe various ongoing initiatives.

Figure 5.2: Changing size and composition of SLT's business, overall and international, and source of growth in international business 1998, 2003, 2008



Source: Case Study estimates

Tariff rebalancing

As has been mentioned earlier in this report, higher domestic call charges were introduced in 1997. The aim of tariff rebalancing is to achieve cost oriented tariffs and eliminate cross-subsidies. An application to the regulator for higher tariffs from early 1998 is being processed. A local tariff basket increase of some 50% is intended by the end of 1999, with rentals increasing more than call charges within this basket. Assuming that some users cut back because of higher prices, and remembering that rebalancing is of course a strictly finite process, a domestic revenue per line multiplier from the entire rebalancing of around 1.5 may be a reasonable estimate.

Adding new lines

The management agreement entered into in connection with NTT's shareholding requires that the number of telephone lines in each of the 28 secondary areas shall be roughly doubled in a few years. This will create a larger customer base and thus larger revenue base. In general, new lines have considerably smaller invoices than old ones, as most heavy users probably already have telephones. Still, more revenue will be generated - a revenue multiplier of 1.3 for a doubling of lines seems realistic, and this will apply to international as well as domestic usage.

Improved utilisation of installed network

SLT is planning to improve utilisation of the installed network. Installed but unused facilities create cost but not revenue. Two main efficiency aspects will be addressed:

- Utilisation of switching capacity, presently at some 80%. Despite the fact that some exchanges are overloaded with respect to traffic capacity, utilisation can be improved in a number of exchanges. Overload will be reduced once the main reasons for repeated call attempts (subscriber busy) are addressed.
- Utilisation of external plant capacity. This needs careful planning, as well as deviation from a traditional principle that the waiter who has been on the list for longest shall be connected first. It is now accepted that where there is capacity any waiting subscriber can be connected, and there is a scheme for giving preference to potential high users. In addition, the network can now be locally expanded according to demand, in order to connect waiting subscribers.

This action is reflected more in static costs than in enhanced revenues.

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Call completion ratio

SLT very clearly understands that improving the call completion rate will add revenue. The call completion rate has already been improved from some 25% to its present 35%. This is still rather low, and further improvements would generate more revenue. Actions to improve call completion include more lines for busy subscribers, enhancement of congested routes, and better maintenance. Our first estimate for the maximum impact of improving the call completion rate is of the order of a 1.2 revenue multiplier (applicable to all call revenues).

Interconnection

The present interconnect agreement is due to be replaced during 1998. For the time being, national calls from the WLL operators will not have an impact on profitability. International calls will generate additional revenue, even if at lower rates than from SLT's own customers. Calls to the WLL operators will generate call revenue, national as well as international. The WLL operators are both competitors and business partners. Overall we assess their impact on SLT's revenues as neutral, to a first approximation.

Cost reduction

SLT's history as a state department did not generate a strong cost consciousness. However the concept of reducing costs is now well known and understood. It will need sustained effort over several years, resulting in a much higher number of lines per employee.

New services

SLT also plans some new services. However, the impacts from these are not significant in the next few years. Many new services need investments, and are not immediate cash cows.

Growth of international traffic

A strong continuing growth in international traffic is expected, built on the solid performance of the past ten years. During this period international outbound traffic has grown at some 20% a year, and inbound traffic at some 17% (though these rates are not expected to continue). The growth rate in subscribers for the same period has been about 11%, so international traffic growth has been at some 6 - 9 % per subscriber.

The combined effects of the initiatives above, assuming that they are successful, could be to more than double SLT's domestic revenues over a five year period, as well as containing its costs to much less than proportionate growth. The future of the international business is discussed in more detail below.

5.2.2 Specific actions that SLT may consider to mitigate losses in international revenues

Before we look at the specific further actions that SLT may consider, a short SWOT analysis may be useful. Table 5.3 below presents one view of this.

It is only natural that concerned Sri Lankans, and in particular the staff of SLT, should feel keenly aware of the negative aspects on the right-hand side of this table. However, it is important to realise that similar problems are shared by the majority of developing countries that currently have a significant inbound traffic imbalance. The positive aspects on the left-hand side are more special to Sri Lanka. In other words, Sri Lanka has a comparative advantage, at least within its region, in coping with the new international environment.

We now look in more detail at actions that SLT could consider in some or all of the scenarios of the previous section. An illustrative selection of these are grouped in Table 5.3 (left chart) under the following headings:

- Domestic market growth.
- Competing in markets of correspondent countries.
- Actions relating to traffic routing (this may include competing to handle third-country traffic (neither originating nor terminating in Sri Lanka)).

The column headed "Likely scenarios" ties this in with the scenario modelling by showing when particular scenarios provide stronger incentives than others for an action. (The omission of a scenario against an

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action does not mean that the action is unlikely under that scenario, just that it is not especially promoted by that scenario).

Table 5.3 SWOT analysis for Sri Lanka in the new international telecoms environment

Strengths	Weaknesses
SLT highly profitable.	Over-reliance on revenue from inbound international calls.
Telecoms sector reform already under way: local loop competition in place, new ownership and management at SLT.	SLT still suffering from inherited inefficiencies, and lack of commercial skills.
Strategic geographic position.	Sri Lanka small - lacks international influence.
Large Sri Lankan expatriate community overseas generating significant international traffic.	
Economy relatively well-developed for region; growing fast and outward-oriented.	
Sri Lanka small - can be relatively fast and flexible in meeting change.	
Opportunities¹⁹	Threats
Addressing new markets for outbound calling, e.g., people without phones.	Rapid loss of revenue from inbound international calls.
Capturing revenues for inbound calling, e.g., SLT calling card for expatriates.	Full force of international competition felt too soon - before enough time for adjustment.
Attracting new businesses with international interests to settle in Sri Lanka.	
Attracting regional transit traffic.	

Source: Case Study

¹⁹ Only the main opportunities are mentioned in this table - a fuller discussion follows below.

Table 5.4 Further international business options for SLT

Market and action	Remarks	Likely scenario	Cost	Risk	Potential return
Domestic market					
Grow number of lines	Already under way	All	High	Low	Medium
Provide enhanced services for business	Planned anyway	All	Medium	Low	Medium
Encourage more subscribers to take IDD access	Already under way	All	Low	Low	Medium
Reduce international outbound tariffs a little	Already under way	All	Low	Low	Medium
Reduce international outbound tariff a lot	Consider in a few years	1	Low	High	High
Improve opportunities for international calling by people with no phone line, e.g., payphones, bureaux, voicemail service	Takes time	All	Medium	Low	High
Introduce varied tariff packages	Depends on billing system	All	Medium	Low	Medium
Use good phone service to help attract new international businesses to Sri Lanka	Coordination with others vital	1	Medium	Medium	High
Correspondent markets					
Launch own country-direct service and own calling cards (prepaid or account-based) to attract to SLT call revenues from Sri Lankans abroad	Already under way, could be given priority	3	Medium	Low	Medium
Investigate and stimulate “missing” traffic	Worth a try	All	Low	Low	Low
Reverse callback (sell call origination in Sri Lanka to callers elsewhere)	New distribution channels needed	3	Medium	Medium	Medium
Establishing end-to-end operations between Sri Lanka and key correspondents	Major step	2	High	Medium	Medium
Traffic routing					
Actively attract the refile of traffic inbound to the region	Short-term option only	1	Low	High	Medium
Actively attract other countries’ transit, overflow or alternately routed traffic	Potential long-term option	1, 2, 3	Low	Low	Medium
Refile a portion of own outbound traffic	Short-term option only	2	Low	Medium	Low
Reroute outbound transit traffic	Minor option	3	Low	Low	Low

Source: Case Study

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General observations on the actions

Before discussing particular actions from this table, a few general observations are in order.

- SLT has a wide range of options for regenerating its international revenues - some already recognised and taken up or planned, others yet to be considered.
- Any quantification of the revenues from these options would be imprecise. However, what they should add up to is a solid, profitable international business (albeit missing today's artificially inflated profits). Long-term, the international business will contribute a share of SLT's revenues and profits which corresponds to the share of international assets in its asset base, currently estimated at between 10% and 15%.
- The decision on whether or not, and if so when, to undertake any action will be influenced by many factors, including (but not limited to) those of cost, risk and potential return which have been roughly indicated in the table. The environmental conditions implied by the scenarios are among these factors. They may make an action more or less likely, but will not be decisive in the absence of other good business arguments.
- Given inevitable uncertainty about the future environment, and the likelihood that mixed conditions will co-exist (including elements of more than one of the modelled scenarios), SLT would do well to focus on actions which are of value in a wide range of circumstances.
- In any case the actions which would be differently fostered by different scenarios are almost by definition short-term in nature. Given limited resources for new business development (especially a shortage of skilled management time), this would better be devoted to long-term projects.
- Revenues may derive from generating new traffic (growing the market), capturing existing traffic (growing or keeping market share), or enhanced unit revenue (through enhanced value). In Sri Lanka's particular current situation, because of its large underserved home market, low competition and falling world prices, new traffic generation is likely to be the most rewarding and lasting approach. In five years' time its focus will need to shift towards actions geared to preserving market share and generating more higher value traffic, and in ten years' time market share will be a major concern. Figure 5.4 below illustrates.

Comments on particular actions

Line growth and IDD access growth: Both of these are definitely planned and should bring in useful new international revenue. However, it is only reasonable to assume that the heaviest international callers are already connected, so that new lines on average will have relatively low international traffic. Packages are about to be launched permitting international calling up to a fixed monthly ceiling (3'000, 5'000 or 10'000 Rs) with no initial deposit. Personal Identification Numbers (PINs) to avoid unauthorised use of IDD have been available for some time, but are not widely used. The takeup of these new services will be greatly influenced by how well they are marketed.

Enhanced business services: These are already planned and will contribute usefully to building Sri Lanka's new image as an advanced centre for international business - it has declared its intention to be "number one in the region". In themselves, however, they constitute a relatively small market and one requiring significant initial investment and marketing effort.

International outbound tariff cut: In accordance with our earlier discussion of the price elasticity of demand, we believe that SLT will only be well-advised to make big cuts in its international tariffs if this becomes necessary to counter large losses of market share, e.g., to competition from voice over Internet, or from reverse direction calling, if this has become a net loss proposition. If it does find itself in this position then the new low prices will of course strengthen its pitch to attract new international business to Sri Lanka. However, it would be unlikely to cut tariffs dramatically primarily in order to attract this business.

Varied tariff packages: A useful tool for any PTO. Unfortunately implementation depends on an up-to-date billing system, which has to be cost-justified for the entire business, not just the international portion. When SLT's billing capability permits, and subject to regulatory approval, it will want to consider such possibilities as:

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- varying the economy/discount periods and rates;
- special offers for a trial period, e.g., lower rates for long calls;
- discounted call charges (both domestic and international) in return for higher monthly charges;
- lower international call charges for bona fide resale purposes (through licensed bureaux etc);
- “family and friends” type packages in which calls to nominated numbers, which could be abroad, receive a discount.

Provide international calling opportunities for people not on the phone: This covers a number of possible actions, in some of which the WLL and cellular operators could choose to compete with SLT, including the provision of:

- more payphones;
- prepaid smart calling cards to facilitate international calling from any phone, including payphones and non-IDD lines (initial access being by a domestic number or access code) - a competing payphone operator already provides these;
- voice mail boxes for receiving messages (“virtual telephone service”);
- more bureaux enabling calls to be made and received in comfort, with quiet and privacy (unlike payphones, which typically have to be used standing at a busy roadside). These bureaux, some of which might be collocated with Post Offices, could also double as email bureaux, with home message delivery and collection organised in conjunction with postal services.

All indications are that such facilities would be intensively used, probably in the first instance for domestic calls, but also increasingly, with proper marketing, for international calls. The potentially large number of occasional users points to a large market overall for occasional international calling. (Sri Lanka has four million households and 1 to 2 million expatriates; this suggests that at least half the population has some reason for international calling. Recently, Village Pay Phones in Bangladesh have achieved more than 40% of revenue for international calls, mostly to expatriate workers from the villages²⁰). Call charges could be determined to appeal to the market in question, and need not be closely related to those prevailing on individual lines.

Own country-direct and calling card services: Again, this represents a range of actions, some of which are already under way, including:

- **country-direct:** enabling Sri Lankans abroad to be connected directly to a Sri Lankan operator or automatic service, and have calls billed to their own account. Users need their own PIN and credit account. This service has already been launched for the UK in conjunction with BT and for Japan with KDD, and will be rolled out to other direct correspondent countries on the basis of this early experience. Initially, it will be tariffed and sold as a premium service, though this may soon have to change in the light of competition from similar but low-priced card-based services.
- **chargecards:** similar to country-direct, but services made available among a wide range of countries, not just between Sri Lanka and major direct correspondents. A logical next step once several country-direct services have been set up.
- **smart calling-cards:** a blanket term for a variety of customised services. Cards may be either credit account linked or prepaid, and the “smartness” may reside in the card itself or in the network, accessed by a PIN. The technology offers many opportunities for added services as well as flexible tariffing. New families of offerings can be devised targeted at specific markets, e.g., business travellers, students or expatriate domestic workers. The first SLT services are due to be launched in the first half of 1998.

“Missing” traffic: This action refers to a thorough analysis of the factors underlying existing traffic patterns, along the lines indicated in section 3.2 of this report, to identify potential traffic streams that have

²⁰ World Telecommunication Development Report 1998, ITU.

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not yet materialised . For example, there may be scope for joint actions by SLT and the Belgian PTOs to stimulate traffic between Sri Lanka and Belgium.

Reverse callback: The attractiveness of this set of activities depends both on the relative profitability to SLT of originating versus terminating traffic, and how rapidly SLT is able to recognise and react to change in this area. The need to establish new distribution channels abroad is a big hurdle to overcome.

End-to-end operations: NTT has sales offices in several of Sri Lanka's major correspondent countries. It would be natural for it to consider setting up facilities-based operations in them and international operations among them. However this would be a big new step for NTT, whose experience is almost exclusively of domestic operations. Furthermore, setting up facilities-based operations in other countries would most likely imply bringing forward the end date of the international monopoly/duopoly in Sri Lanka in order to provide reciprocity, in the spirit of the WTO agreements.

At present it seems that SLT would have more to lose than to win by taking this step. For the time being its proper priority is domestic rather than overseas expansion, though after the year 2003 this perception may change. However the wider perspective of NTT worldwide could tip the balance the other way even before this date.

Outbound refile: Sri Lanka is already losing some inbound settlement revenue because of refile. The opportunities for Sri Lanka to benefit by refiling a portion of its own outbound traffic are limited by the relatively small amount of traffic involved, as well as by the likely short lifespan of significant rate differentials. It may well not be thought worth the cost in terms of correspondent relationships, or simply because of the additional inbound refile that could ensue.

Third party refile: In principle Sri Lanka could attract a large volume of third party refiled traffic by setting its rates at attractive levels in relation to those of its large neighbours - such as India, Pakistan and Bangladesh. Again, however, this is bound to be a short-lived opportunity. And again it may be thought not worth the cost, this time in terms of relationships with countries with which it is co-operating, not least in setting up a regional free trade area. It may be seen as less problematic if it is simple rerouting via Sri Lanka of traffic that is already refiled via a different hub, rather than "new" refile.

Other third-party traffic: The objections to refile do not hold for legitimate transit traffic, or for overflow or alternate routing arrangements. There is every reason for Sri Lanka to aim to attract such traffic, and this could be a lasting as well as a sizeable market, given Sri Lanka's favourable geographic position between South Asia and much of the rest of the world.

5.2.3 Actions by other players

The previous section looked in some detail at how the international monopoly, SLT, may react to the new international environment. As has been explained, it is for the time being the main player in this arena. But it is not the only player. This section looks briefly at how other interested parties may react - the Government of Sri Lanka, the regulator, other actual and potential competitors, and last but not least, users.

The Government

The Government's main concerns will probably be:

- ensuring the success of SLT and the WLL operators in achieving the demanding domestic rollout and quality targets that they have been set;
- a successful initial public offering of SLT's shares in three years' time;
- handling international pressure (from WTO partners and major users) for full liberalisation and lower international prices.

These factors combined may lead it to reconsider the length of the international duopoly, which is currently planned from 2002 to 2007.

The regulator

The regulator must be responsive to the Government's concerns. In addition, he will be concerned with:

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- achieving fair and sustainable interconnect arrangements, which will encourage all operators to stimulate international traffic. This requires a good understanding of the cost structure of Sri Lanka's telecoms industry, and a study of this is currently receiving priority;
- ensuring that SLT's new tariffs are cost-oriented, and neither too high (thereby penalising customers who have no choice) nor too low (thereby penalising competitors who cannot match these prices without cross-subsidy). This too requires a full cost study;
- deciding when new services such as voice over the Internet infringe SLT's monopoly, and what if any oversight or policing they require;
- understanding and responding to Sri Lankan users' needs and priorities.

Because of the importance of international telecoms to the economy (as highlighted in Chapter 1) and because of SLT's key role for the next five years in delivering international telecoms, we would expect that overall his stance would be supportive of SLT's efforts to improve service and efficiency over this period. However, he will equally support other operators in stimulating international traffic flows through interconnection with SLT's network. Should SLT's service levels deteriorate (whether inadvertently or otherwise, for example in retaliation to others' actions that SLT perceives as offensive) then the regulator would be obliged to take prompt corrective action.

Other competitors

As soon as fair interconnect arrangements arrive, we expect the WLL and cellular operators to wish to share to the maximum extent in the high profits from international traffic, for as long as these are available. They will stimulate international calling by their own customers, and may compete with SLT for the traffic of people who do not have their own lines (see previous section). At least some of them will bid for the second international licence. Until this is awarded they may continue to support the duopoly idea, but after it has been awarded a rapid change of tune from unsuccessful applicants would be only natural.

As long as international prices remain substantially above cost, it is only to be expected that new competitors offering services like call-back and voice over the Internet will seek to enter the market, even if this is of questionable legality. If their activities are not easily detected or prevented, they will flourish until they are so high-profile as to force the regulator into action.

Users

With the growth of choice, users will exercise more power. Because they originate large volumes of inbound traffic, expatriate Sri Lankans in industrialised countries are a particular force. They will seek out the best buys, which are increasingly likely to involve the Internet, thereby bypassing inbound settlements. Users in Sri Lanka may be more conscious of the trade-offs between domestic and international service and therefore more patient with the status quo (which should in any case be rapidly improving).

6. CONCLUSIONS

6.1 The situation of Sri Lanka

Our study has shown that international settlements are a financial flow of great significance not only to Sri Lanka Telecom Ltd (SLT) but to the Sri Lankan economy, and indirectly therefore also to Sri Lanka's main trading partners. This significance derives not from their actual size, which is not great in relation to the balance of payments, far less in relation to GDP. Rather, it derives from their great support to the profitability of SLT as a whole, and in particular to the profitability of SLT's international business. International telecoms in turn is already making a major contribution to growth in Sri Lanka's outward-oriented economy. It has the potential to make much bigger contributions in future. Further, Sri Lanka in some respects is a leader in the region. With increased economic growth it could become a catalyst for change in the wider markets of South Asia.

As the "goose that lays the golden eggs" (eggs which will be shared by Sri Lanka and its partners), the international telecoms business must be cared for and enabled to emerge fit and well from this period of adjustment. While our assessment of SLT's costs of handling international traffic is very rough, we do not believe that these costs currently represent an obstacle to achieving competitive pricing levels; and they will be reduced in future. Looking after the goose therefore primarily means filling the revenue gap created by reduced net international inpayments.

Present traffic patterns are closely related to communities of interest, represented for example by trade, tourism and expatriate workers. Present traffic imbalances result more from differing levels of prosperity at the two ends of a relation than from price or cost imbalances. They will therefore not be quickly or easily changed.

Sri Lanka's ability to handle the changing international telecoms environment is closely linked with the particular situation that its telecoms industry now happens to be in. There are now two active competitors to SLT providing local connections using wireless local loop (WLL) technology. SLT was partly privatised in 1997 (a 35% shareholding, and management control, being taken by Nippon Telephone and Telegraph (NTT)). The agreement between NTT and the Government of Sri Lanka (GoSL) guarantees a continuing international monopoly for five years, and a further five years of duopoly are then planned. (The first five years corresponds to the time expected to be needed to complete tariff rebalancing between domestic and international services). The agreement also specifies a demanding series of targets for network expansion and quality improvement during these five years.

Continuing steady profitability of SLT is naturally seen as very important by its shareholders. It is of special importance at present because both NTT and GoSL are committed to preparing the company for a public offering of shares in three years' time.

Management attention for the next five years will therefore properly be focused on the great changes needed to the domestic network. These incidentally will also be very beneficial to the international business, as they will both enable more people to make and receive international calls, and improve call completion rates. Meanwhile, international tariffs will be brought down to a level at which SLT will be able to meet competition within a duopoly market structure. This is of course higher than the level that would be expected with full, open competition.

The most important consideration in setting prices is maximising revenues, which at this stage of Sri Lanka's development, because of relatively low price elasticities, is not likely to be achieved by sudden large price cuts. However, we do expect gradual but sustained falls in prices, which will form a solid foundation for building traffic between existing customers and their overseas contacts, and will in due course open international calling to new market segments.

The five years of the Management Agreement happen to coincide with the five year adjustment period envisaged in the specified scenarios. For this reason, fortuitously, we expect that SLT will be able to handle the adjustment relatively well within this period. However, as has been explained, the end point for prices will be one of restricted rather than open competition.

Against this background we state some general principles for change in the settlements system, and the specific requirements of Sri Lanka's situation. This leads us to conclusions about the scenarios.

6.2 General principles for change in the settlements system

1. Whatever changes take place in the international environment should be gradual and predictable, while retaining some flexibility. Sudden, sharp changes are destabilising.
2. In particular, sudden large cuts in a PTO's net inpayment, where this is a large part of its international revenue, must lead to a reappraisal of its international business. In a monopoly environment, immediate reactions are likely to include reducing the proportion of resources devoted to the international business. The handling of international traffic could be adversely affected, which could colour overseas customers' perceptions of their own carrier's service.
3. To the maximum extent possible, companies should be able to influence their revenue streams. Externally imposed changes breed fear and defensive behaviour.

6.3 Points specific to Sri Lanka

1. The changing international environment has the obvious consequence of reduced net settlement inpayments to SLT. In addition it does offer new business opportunities to SLT. However, the revenue represented by these new opportunities is an order of magnitude less than the revenue lost from inpayments, at least in the early years of adjustment. Thus there is a case for transitional measures to aid adjustment.
2. One reason that accounting rates between Sri Lanka and certain countries have not fallen faster is that a portion of inbound settlement payments has been earmarked to repay past loans for equipment purchase from those countries. Past arrangements of this kind are however due to end in the next few years, and in the new environment are unlikely to be replaced.
3. SLT's new management takeover depended on strong future revenue growth. The international side of the business has to contribute to this. Stable or slowly shrinking net international inpayments are foreseen, and alternative revenue sources can and will be developed; but this takes time and planning. Correspondent countries could contribute to this development, for example by offering Sri Lanka the opportunity to carry some regional transit traffic.
4. One of the terms of SLT's new management agreement was maintenance of SLT's international monopoly for 5 years, with a duopoly thereafter for a further 5 years. This commitment greatly enhances SLT's ability to manage its business in the changing international environment.
5. SLT has plans for developing its international business in a positive way. It does not want to be diverted into less productive or retaliatory activities such as outgoing refile or capacity limitation. However, it could feel pushed into such activities by negative behaviour in others.

6.4 Implications

1. A five year transition period is acceptable to Sri Lanka because it happens already to be planning on major changes over that same period. Had this been otherwise then longer would have been required.
2. Because Sri Lanka's inbound international traffic greatly exceeds its outbound traffic, the major effect of any of the proposed scenarios is simply the reduction in net inpayments. The precise mechanism by which the system changes is of less importance, but scenarios will be better for SLT if they:
 - entail a slower fall in net inpayments, especially in early years;
 - lead to lower prices for end users calling Sri Lanka from correspondent countries;
 - reduce incentives to refile;
 - are controllable.
3. Any scenario which leads to rapid, uncontrollable revenue cuts (such as the FCC benchmark scenario in the form tested by this study) is inconsistent with Sri Lanka's plans for rapid network growth, building on existing achievements.

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4. The scenario which best meets the requirements outlined above is that of a gradual move towards termination rates. Because these can be adjusted by each country to meet its changing circumstances, they maximise local control and overall flexibility. Uniform rates for all comers also reduce incentives to refile.
5. SLT has a wide range of options open to it for growing its international business to make up the revenue shortfall. Given uncertainty about scenarios and the overall likelihood of a mixed environment, it will be best advised to concentrate on options which will be of permanent value in any environment.
6. The single most important area of action for SLT is to grow access to international calling. It will do this through:
 - meeting demand for lines;
 - making more lines IDD-accessible;
 - providing widespread public access to international calling for those without their own IDD-accessible line.

The other access operators in Sri Lanka (WLL and cellular mobile) will also make an important contribution in this area.

Users will plainly benefit from the lower price levels that will come with full international competition. This is an important ingredient in making Sri Lanka an international business centre. NTT may also find that its worldwide interests are well served by bringing forward the end of the monopoly in Sri Lanka. The Government of Sri Lanka will have to balance these and other considerations in deciding its long-term policy on international competition.