2

Telecommunications in India

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2.1 The Beginnings

As nation-states go, independent India is only 50 years young. As a result of invasions from Western and Central Asia in the 1300s and of British economic and political expansion from the 1600s, India today consists of many once distinct nations, kingdoms, and ethnolinguistic groups spread over 3 million sq km. Steamships, railways, and telegraphy allowed India's British colonial rulers to consolidate, control, and extract resources from the jewel in the crown of their extensive empire. This chapter examines the ability of independent India to develop a telecommunications infrastructure from its origin as a one-time law-and-order maintenance tool of the British Empire. Will service to the ill-served rural public be the next focus, or will it be value-added services for predominantly business and commercial sectors? Or will the future bring some innovative combination balanced with myriad other interests?

2.2 After Independence in 1947

In quantitative terms, there have been major strides since India gained independence. As of October 1996, there were 13 million[1] access lines for a population of 900 million, more than 160 times as many lines as in colonial India. The goal is to increase the number of telephones to more than 25 million by the year 2000. The waiting list for a telephone, at about 3.3 million, is 165 times that at the time of independence in 1947.

Since 1991, there has been strident talk about the need for demonopolization of the government-administered telecommunications industry, a threat that spurred the Department of Telecommunications (DOT) to step up expansion. In 1995–1996, a record number of 2.2 million lines were made available as new connections. The annual new line addition rate has increased eight times in the decade ending 1995–1996, but the waiting list grew even faster, as seen in table 2.1.

In 1997, 1.5 telephones were available for every 100 people. In spite of talk about rural development, telecommunications service continues to be 85% urban, with penetration rates of up to 15% in Delhi and Mumbai. Of India's 600,000 vil-

Table 2.1. Telephone Growth from 1985 to 1997 (in millions)

Fiscal	Lines Added	Total Working	Waiting List
1985–1986	0.268	3.27	0.99
1987	0.321	3.49	1.12
1988	0.314	3.80	1.29
1989	0.366	4.17	1.42
1990	0.423	4.59	1.71
1991	0.485	5.07	1.96
1992	0.735	5.81	2.29
1993	0.987	6.80	2.85
1994	1.229	8.03	2.50
1995	1.571	9.80	2.15
1996	2.2	12.0	2.2
1996 Oct.	1.0	13	3.3
1997 March	2.5	14.5	3.0 (est.)

lages 230,000 have telegraph and telephone facilities, although this is better than 1947, when only 400 villages had service. Yet the quality of urban service is still poor, with 18 faults per 100 telephones a month. Operations and customer service facilities are being computerized. Switching equipment is a mix of electromechanical crossbar, SPC analog, and (predominently) electronic digital. In 1985 SPC digital electronic equipment was introduced, and today about 85% of the exchange capacity of about 15 million lines is digital electronic. Analog equipment production ceased in 1992, and old equipment is rapidly being retired. National long-distance and international direct dialing are available from 85% of access lines.

Local exchange access networks are mainly copper wire in underground cables with overhead extensions in suburban areas. The long-distance network uses coaxial cable, microwave and UHF radio, and satellite and fiber-optic links. The government monopoly of equipment production ended totally in 1991, and the private sector began to manufacture the whole range of telecommunications equipment and cables. Nearly 100 new companies have emerged in the last decade. The private sector manufacturing companies have, in a short period of roughly six years, invested about $300 million in manufacturing, compared to about $120 million invested by state-owned enterprises (SOE) in the over 40 years since independence. Competition is making available a variety of equipment at prices ranging from one-fourth to one-third of the former monopoly SOE's prices.

India's telecommunications system shares certain characteristics with those of other developing economies: a poorly developed infrastructure, inadequate policy and policy-making systems, underinvestment, and organization and management typical of a government department or public sector monopoly, with centralized control of policy, regulation, and operations. A unique underlying characteristic of the Indian telecommunications system is its laudable attempt at technological self-reliance. After decades of colonial domination, nationalist political ideology com-

bined with good human resources led independent India to develop local technology or to adapt foreign technology rather than continue a neocolonial technological dependency. In the case of telecommunications limited participation, and even exclusion, of the national private sector and foreign investment led to less success than was expected. A lack of sector leadership similar to that provided by pioneering nuclear and space scientists like Homi Bhabha and Vikram Sarabhai is evident. The strategic ability to pick and choose areas of comparative advantage for indigenous internationally competitive technology development requires imagination and creativity alongside technological and environmental impact assessment skills that are hard to find in procedure-bound administrative hierarchies. The DOT produced obsolescent technology and bought it at incredibly high prices in its own market, which was closed to competitive ideas and products. Domestic competitors (non–DOT government and private) capable of indigenization were not allowed to emerge by the monopolist DOT, making a travesty of national self-reliance. It is incredible that in the name of socialism DOT did not allow its own national private sector companies to produce telecommunications equipment and cables while at the same time it periodically imported equipment from foreign multinationals to supplement domestic production. In the mid-1980s under the leadership of the Department of Electronics, the monopoly that DOT's company units had on telecommunications equipment production was progressively diluted. The foreign exchange crisis of 1991 and the collapse of the Soviet Union, provider of much of the ideological inspiration, led to a dramatic discarding of state monopoly and a total liberalization of Indian industrial economic policies, including those relating to telecommunications.

Implementation of reform in the capital-intensive telecommunications sector cannot be isolated from India's long-term economic problems. International donor agencies and the Planning Commission recommended the public sector approach to economic development in the 1950s and 1960s, a strategy that produced a DOT that has not responded to the public interest in adequate measure. In the 1990s, after decades of neglect, the Planning Commission, the Department of Electronics, and telecommunications users recognized telecommunications as a strategic infrastructure that could stimulate the economy to higher rates of output, export, employment, and earnings and could increase the efficiency of government. What needed to be done? The long- and short-term agendas of the Telecommunication Mission under Rajiv Gandhi (1987) and early Telecommunication Commission documentation (1989) listed objectives, challenges, and plans of action. Since then, the Department of Telecommunications and many other state agencies in India, in the world's largest democracy, seem regrettably to demonstrate increasing incapacity to promote national development and simultaneously accommodate diverse interests. This is what political analysts call India's growing crisis of governability. The direction and operation of the telecommunications sector in India is stuck in an obsolescent groove, partly because it was mistakenly entrusted to a government department that has turned into a neofeudal bureaucracy, immune to the public interest it is expected to serve, and partly because of the deterioration of the Congress party and splinter groups like Janata Dal and others into an interven-

tionist personality-based political machine that has deprived the civil service of strong, stable direction.

2.3 Institutional Structure

The Indian Telegraph Act of 1885 and the Wireless Telegraph Act of 1932, passed in colonial times, have been interpreted as providing the legal basis of the central government's telecommunications monopoly. At the time of this writing (January 1997) telecommunications services continue to be a federal responsibility under the Ministry of Communications. Posts and Telecommunications used to be one combined department of P&T under the Ministry of Communications. Telecommunications were separated from Posts into a separate Department of Telecommunications (DOT) under the Ministry of Communications in 1985. The Ministry is headed by a minister of state who is a member of the publicly elected ruling political party. The DOT reports to the minister through a secretary who is also the director general of the DOT and chairman of the Telecom Commission (a body formed in 1989 by reconstitution of the Telecom Board). The Ministries of Economic Development, Electronics, Finance and Industry, all concerned about telecommunications planning, are represented by part-time members of the Telecom Commission, which also includes an additional four full-time DOT officers as members (including the director general as chair) and a large support staff of engineers and accountants. The Telecom Commission is the decision-making unit of the DOT for policy, regulation, planning, and service operations. The field organization consists of circles (every state or a group of states), districts, and subdivisions. The total staff of approximately 470,000 is managed from New Delhi through circulars, directives, orders, and 14 volumes of rules. The work culture emphasizes hierarchy, procedures, precedents, and audit requirements rather than client service, openness, accessibility, and connectivity, characteristics of the very technology telecommunications service is supposed to provide.

In the late 1970s and early 1980s protests against poor service by subscribers, politicians, industrialists, and business leaders coincided with global and national pressures for liberalization and a new emphasis on developing microelectronic technologies. The result was an establishment of a parliamentary committee in 1981, which recommended many structural and service improvements. It was the young prime minister, the late Rajiv Gandhi, who ordered the bifurcation of the Ministry of Posts and Telegraphs in 1985 and paved the way for promotion of a new culture through the creation in 1986 of two supposedly autonomous public sector undertakings (PSUs) to expand, develop, and manage crucial segments of the Indian telecommunications system. The Mahanagar Telephone Nigam Limited (MTNL) was set up to run services in Delhi (the nation's capital) and Mumbai, formerly Bombay (the nation's commercial center), which together have 25% of India's phones. Telecommunications in the rest of the country continues to be run as a government department because of the resistance of staff to be corporatized. Videsh Sanchar Nigam Limited (VSNL) was set up to run international services.

The DOT bureaucracy resisted the high-level political initiative for the creation of VSNL and MTNL, as they would restrict the DOT's fiefdom and freedom. Nevertheless, both units (although more the VSNL than MTNL) have been very successful in introducing new technology, tapping capital markets, increasing profitability, and creating a new management culture basic to public service. Problems created by the dual structure of wages and promotions between DOT and its services corporations, MTNL and VSNL, led to the appointment by the government of the Athreya Committee in 1990 for restructuring the DOT. The Athreya Committee's majority report recommended the creation of five public sector corporations, one for each region and one for domestic, interstate, and long-distance telecommunications. The Athreya Committee's majority report said that the MTNL should be concerned with raising finances for projects and that the DOT should function as an independent policy-making and regulatory body and not concern itself with service operations. The most significant recommendation was to allow private sector companies to provide all value-added services, including new services like cellular mobile radio telephones and radio paging. A minority of the Athreya Committee members opposed corporatization. In the end, however, the fall of the Janata party government and the rise of a dissenting member of the Athreya Committee to the chairmanship of the Telecom Commission led to the consignment of the committee report to the archives.

The development and production of telecommunications equipment were made the government's exclusive monopoly under the Industrial Policy Resolutions of 1948 and 1956, which were meant to usher in a more socialistic pattern of society. Until recently the sole suppliers of equipment to the DOT have been the DOT's own three factories and, in the public sector, the Indian Telephone Industries, Hindustan Teleprinters, and Hindustan Cables (with at least 10,000 surplus workers between them). Their bureaucratic organizational structure and total control by the DOT has militated against realization of the national ideal of indigenous technology development. Realizing that the DOT's own Telecom Research Center (TRC) and its PSUs had failed to develop any indigenous switch designs and to further progress toward the ideal of self-reliance, the Department of Electronics set up the Center for Development of Telematics (CDOT) in 1984 to develop indigenous switching systems as an autonomous research and development society, jointly funded by the DOT and the Department of Electronics. The CDOT undertook the design, development, production, and commercial deployment in the telephone network of a series of digital electronic switches—PBXs, rural automatic exchanges of sizes ranging from 128 to 2,024 lines, and larger exchanges of 10,000-line capacity for use in urban centers. Despite delays, the CDOT has done an extremely good job, demonstrating India's telecommunications research and development capability. Most significantly, the CDOT ensured that for the first time private sector companies were given licenses to produce switches to its designs and standards. Thus was laid the foundation for India's private sector production of telecommunications equipment. Over 30 CDOT-switch manufacturing companies and over 400 vendors of components emerged. Produced by the thousands, the CDOT's rural automatic exchanges, eminently suitable for unaircondi-

tioned environments and uncertain power supplies, have revolutionized rural telephony, enabling nationwide direct dialing to be extended to village subscribers.

The Telecommunications Research Center of the DOT has been merged with the CDOT. Standards continue to be set by the DOT's Telecom Engineering Center (TEC), an organization created in 1991, but no simple, impartial, and rapid approval process is in place to help private sector manufacturers secure contracts with the DOT, which continues to be their major buyer. All equipment to be connected to or forming part of the public switched (government or private) telecommunications network (PSTN) must be validated, that is, tested for compatiblility with and satisfaction of the requirements of services offered, by the Telecom Engineering Center.

The separation of ownership (by DOT) and management of services (by autonomous corporations) and the creation of the Telecom Commission in the 1980s liberated the potential for achievement in parts of the DOT, leading to a significant change in performance. While the benefits of autonomous responsibility outside the confines of a government bureaucracy may seem obvious, it is understandable that in actual practice the parent organization has been fighting many attempts at decentralization, since it is a reduction of its power base.

2.4 Regulation

The Telegraph and Wireless Acts of colonial vintage (1885 and 1932, respectively) are the only legal bases of the telecommunications system in India. Section 4 of the Telegraph Act of 1885 gives the federal government the privilege to establish, maintain, and operate a telegraph system in India and empowers the government to grant a license, under such conditions and in consideration of such payments as it sees fit, to any person to establish, maintain, or work a telegraph within any part of India. The term "telegraph" was defined to include all wire and wireless forms of communication such as telephones, telex, video, data, or radio. Section 8 empowers the government to revoke any license for breach of any of the agreed-to conditions. In accordance with this act in British colonial India, private firms were licensed to operate international services and the local phone services in the cities of Bombay, Calcutta, Madras, Karachi (now in Pakistan), and Ahmedabad. Under this act, private firms may continue to be licensed to operate services in India today. Private telephone service in the Tata town of Jamshedpur continued until the mid-1960s, when that too was taken over by the union government.

The Indian Telegraph Act of 1885 stipulated that any dispute between subscribers and the service provider (which could be units of the DOT) would be resolved by an arbitrator appointed by government, which in effect meant the director general of the service itself. This worked against the spirit of a modern democracy (of, by, and for the people) in that civil services were given authoritarian power that reduced the citizen-consumer to a nonentity. In a hearing in 1972 the Indian courts rebuked the telecommunications authority, that is, the director general of the P&T, for taking action against a subscriber without a hearing. The

court told the P&T that a public authority ought to act in a manner consonant with the rule of natural justice. It was similarly reminded in 1976 that the lack of opportunity for representation by subscribers vitiated the principle of natural justice. The Consumer Protection Act of 1984 has given considerable power to the Consumer Grievance Redressal Courts constituted under the act to discipline suppliers of goods and services found wanting. In the last 10 years several hundred telephone users have been awarded damages by the DOT's service units, through Consumer Redressal Courts, for erroneous charges and poor service. Clearly, a body of updated rules and regulations are required to govern the behavior of the telecommunications service provider. The only act related to telecommunications passed in independent India (1950) is limited to "unlawful possession of copper telegraph wires." Given recent decisions to allow private sector participation in the provision of basic (wired) telephony, cellular mobile radio telephony, radio paging, audio and video conferencing, and many value-added services, it is clear that there is a need for new legislation to take into account the end of the state monopoly as well as competition, consumer justice, and proper regulation of the sector.

The Government constituted a high-powered committee in 1992 (known as the Nanda Committee) to suggest changes and amendments to the Indian Telegraph Act 1885. The report that this committee submitted in 1992 was also not to the liking of the bureaucracy in the DOT, as it would have involved separation of regulation from operation of the network. So, like the Athreya Committee report, this, too, was consigned to DOT's vast archives.

The opening up of the economy initiated by the Rajiv Gandhi administration in the mid-1980s led to changes in the industrial policy resolutions of the 1950s. The DOT is no longer the monopoly producer of customer premise equipment. However, as a major buyer of equipment produced by competitive manufacturers, DOT must set interface and type standards, and an impartial third party accords approvals. Competitors of the DOT seeking to provide value-added services will need to be given timely specifications for interface for interconnection with basic service if they are to stand a fair chance.

2.5 Vested Interests

Opposing interests evident in the telecommunications sector in India are the DOT bureaucracy and the private sector and the older DOT engineers, on the one hand, and the younger research and development groups like CDOT, VSNL, and MTNL that have proved more efficient, on the other, with customers, independent economists, and public policy advocates stuck in the middle. In addition the rhetoric of indigenization clashes with the reality of imports, and competitive egos pepper all factions and issues. What has become abundantly clear over the last four decades is that an inefficient bureaucracy like the DOT, based on its poor record, cannot hide behind claims of representing the national and public interest. It is inconceivable that a public bureaucracy that claims to implement government policy in favor of the poor would resort to revenue generation measures that include periodic rises in rentals and call charges, including calls from public telephones, the

most widespread form of telephone service available to the majority in India; the sale of licenses to provide services to the highest bidder; and the fixing of high, cost-unrelated charges for leased circuits.

It must be acknowledged that in a short period of time CDOT has done pioneering research and development on small switching systems in India, but its leadership has been less than fair in claiming that it has developed the full range of exchanges and features in the time promised. It must also be acknowledged that the evidence of up-to-date technology transfer from transnational corporations to developing countries is rare. Alcatel's agreement to manufacture the older E-10B with ITI in 1982 is a case in point. It is the competition from several foreign switch manufacturers (Siemens, Ericsson, Fujitsu, AT&T) that made the difference in 1992 when Alcatel agreed to transfer OCB-283 know-how, a strategy that India might be in a position to use profitably in future transactions, given the recent liberalization of industrial policy.

There has always been a conflict of interest between the expansion of services for urban users and the provision of basic telephone service for the masses. The creation of VSNL and MTNL helped to provide business users and middle and upper classes with better services. In spite of political and bureaucratic rhetoric in favor of developing rural areas DOT's rural outlays in the five-year plans have not been adequate. The development of the rural automatic exchange by CDOT has been the only significant activity for the rural population. Beginning in 1992, for the rural population, spirited action was taken by the DOT to install public telephones in large numbers in the villages. Helped by the indigenously developed and produced CDOT rural switches and analog multiaccess rural radio equipment, the DOT, in a highly directed and monitored program, provided over 200,000 of India's more than 600,000 villages with modern public telephones capable of nationwide dialing.

The national objective was to link all villages by telephone by 1997. This goal is likely to be delayed until the year 2000 because private sector entry into basic telephone services envisaged by the 1994 national telecommunications policy is still mired in some difficulties as of this writing (January 1997). The private sector licensees were obligated to provide a specified number of telephones to villages under the conditions of license.

The term "universal" holds no meaning in India except in the infinitely long term. Colonial India had one telephone for every 5,000 people. After 40 years of DOT dedication and more than a doubling of the population, independent India has little more than 14 telephones per 1,000 people.

In 1996 there were over 13 million access lines for 900 million people. It is estimated that there is a demand for 12 million more lines, even though the annual price for a modest basket of services is 150% of the average Indian's per capita annual income, in contrast to about 4% in developed countries. Nine cities account for over 50% of the access lines. Under 7% of the subscribers generate 70% of the telephone revenue. International telecommunications generate over 30% of the total revenues in contrast to the 10% in developed countries. In the developed world, prices are closer to actual costs and are driven down by competition and regulation. Public telephones in cities like Murubai produce 10 to 20 times the average of private telephone revenues.

The Indian telecommunications system reaches out to 21,000 different geographic locations, each with its own central office, with telegrams, telex, and telephone services. Long-distance calling is available to 85% of the access lines. Over 85% of the overall network is switched digitally. Digital transmission takes place in over 65% of the intercity links, while impaired local cable and predominatly analog intercity transmission restricts data communication to 2.4 to 4.8 kilobits (KBPs) per second. A remote area business messaging network (RABMN) of over 600 very small aperture terminals (VSATs) was initiated in 1993. The beginning of a packet-switched network for high-volume data customers was also created to cover over 80 cities.

The VSNL is the investor/owner of three submarine cable systems and provides numerous different types of international telecommunications services. India's international telecommunications service has grown markedly since it was spun off from its DOT parent: International telephone circuits increased from 1,100 in 1986 to over 14,000 in 1996. There is one INMARSAT-C earth station, and four digital gateway exchanges with Intelsat-A earth stations. There are five competitive carriers from the United States to India, two competitive carriers from the United Kingdom and India, and three competitive carriers from Japan to India. The VSNL provides electronic mail, electronic data interchange, packet-switched data, video conferencing, high-speed (64 KBP and upward) intercontinental data circuits, and Internet access and service, all on a monopoly basis, although its monopoly is being undermined by "call-back" service providers in the United States.

2.6 Financing

India's planners have given very low priority to telecommunications development in their five-year plans, with investments varying between 1.47% and 3.07%. It is only during the eighth plan, from 1992 to 1997, that this ratio went up to about 8%, aided by private sector entry into the cellular mobile telephone services section. The proportion of the gross national product invested in telecommunications has been consistently lower than comparably sized developing countries (e.g., Brazil). Given the level of underinvestment, unmet telephone demand, and poor quality of service, it is probably surprising to find that the finances of the DOT are in good shape. This is because tariffs are not based on costs but on revenues, including capital needed by the service providers. Under this regime, it is expected that the DOT will generate 80% of the capital needed for system expansion. The customer unknowingly contributes the needed capital through the payment of telephone bills, resulting in a per capita telephone service price of about 1.6 times the per capita national income, in comparision to 0.05 in industrialized countries. Revenue collection is merciless, and service is often disconnected once the DOT claims a bill was mailed and not paid. The DOT appoints one of its own staff to arbitrate billing disputes against itself, but the contested bill must first be paid at least in part. Applications for telephone service require the payment of deposits, which are periodically increased, even though the waiting period for service is generally longer than a year. Rentals have to be paid in advance and may

be waived in part only if the customers can prove that the service was deficient beyond a fortnight. Reforms in India must also address the continuing treatment of telecommunications subscribers as subjects by its own civil service in the post-colonial era and the inability of tariff-paying consumers to get responsible service from the monopoly provider. There is no foreign or private profit-maximizing villain to blame.

The DOT has excellent engineering talent deployed abroad through the state-owned Telecommunications Consultants of India, Limited (TCIL). The TCIL has carried out a number of consultations and construction works in West Asia and Africa, winning them in global bids. Since the late 1980s, the DOT has been raising money from telephone bonds in financial markets through its service corporation, MTNL. The amount, frequency, and terms of the bond offerings have been determined by the government's overall borrowing policy. The DOT decides on the proportion of the loans that it needs to keep for itself and what it will charge for use of its network for long-distance and international calls. This practice ensures its units high profits and hence liability only to pay the lowest rate of corporate income tax.

The telecommunications sector in India has also been financed, to a small extent, by World Bank and Asian Development Bank loans and tied-aid from donor countries like France and Japan, which support the sales of equipment produced by their own manufacturers.

2.7 International Cooperation

India is a member of the International Telecommunications Union (ITU), the Commonwealth Telecommunications Organization, Intelsat, Inmarsat, Asia-Pacific Telecoms, and The South Asia Association for Regional Cooperation (SARC) Telecoms Committee. Unlike lending agencies whose interests are financial, each of these agencies is primarily concerned with running good telecommunications operations. There is a strong need for impartial technical assistance from these agencies in the establishment of a national telecommunications policy, a policy analysis unit, an independent regulatory mechannism, and a set of workable regulations prior to the introduction of competition and/or further substantial private sector participation. India is the third largest supplier of telecommunications experts in engineering, planning, and traffic areas for the ITU and its technical assistance programs in developing countries.

2.8 Technology

India's attitude toward technology was formed with the goal of self-reliance to avoid perpetuation of its dependence on foreign countries. In the postindependence years the lack of a private sector capable of producing telecommunications technology, combined with advice from international agencies and the apparent success of Soviet industrialization, caused India to invest in government research

and development departments and large public sector undertakings. The departments of Atomic Energy, Space, and Electronics have demonstrated the success of this approach; the DOT has not.

The Posts and Telecommunications set up in-house factories and separate public sector undertakings to produce the equipment it needed. The Telecommunication Research Center (TRC) was set up to conduct research and development to adapt or develop equipment for local production. In several areas TRC research and ITI production achieved good results, such as in the development of open-wire carrier systems and coaxial and microwave radio transmission equipment. In some cases the lack of intellectual and commercial competition led to the selection of inappropriate technologies for local adaptation, obsolete design and research, and poor quality and quantity of manufactured equipment. Switching technology was one such case. The government changed from manufacturing manual local and trunk exchanges, electromechanical switches based on outdated technology, to buying equipment from abroad. In the mid-1960s when AT&T developed its first electronic switch, Indian telecommunications chose to buy the outdated electromechanical Penta Conta crossbar switching techonology from the Bell Telephone Manufacturing Company of Belgium. Indian Telephone Industries set up two special factories to manufacture the equipment and then found the product to be inappropriate for Indian conditions. Telecommunication Research Center then redesigned the crossbar and set up another factory to produce its own version. Further research by TRC led to the development of an indigenous analog electronic switching system that was field tested in the mid-1970s but never went into production because it was already a decade behind world technology. In 1982 the DOT decided to buy the (by then) 10-year-old E-10B CIT Alcatel digital switching technology and set up a plant to produce it in Mankapur. It is hard to understand why local needs and global technologies were not matched better before this time. None of the three cases of switching technology lived up to government rhetoric about self-reliance: The technology was not indigenously developed, it was obsolete by world standards when it was produced and deployed, and it was inappropriate for Indian heat, dust, and high-use conditions.

The first family of digital switches to be designed and produced in India for Indian conditions was developed by the Center for the Development of Telematics, a research center set up outside the government with funding from the departments of Electronics and Telecommunications. By 1996 CDOT digital PABX and rural automatic exchanges up to 40,000 lines were being produced. Indigenous CDOT design research continues while the government has already permitted transnational corporations to manufacture their own large digital exchanges in India. Siemens, Alcatel, Fujitsu, Ericsson, and AT&T are all setting up large-capacity switch manufacturing, while the ITI and CDOT licensed manfacturers between them have an installed capacity of 1.5 to 2 million indigenous digital electronic switches, mainly low capacity (below 10,000 lines). India now has abundant production capacity for switches for up to 5 to 7 million lines per year.

In the transmission sector the DOT is adding intracity junctions and long-haul trunk systems with microwave radio, fiber-optic cable, and satellite links. The Department of Space launches India's national satellite system (INSAT), which

provides transponders for domestic telecommunications and broadcasting services, among others. The government also leases space segments from INTELSAT to support the Planning Commission's NICNET (National Informatics Center's Network based on over 1,000 VSATs, growing to 6,000 by 1998). India has enough productive capacity in jelly-filled, copper conductor telephone cables for connecting customers to central offices. Fiber-optic cables are being produced through joint ventures with foreign firms. The interconnection of new rural digital switches over reliable media has become an acute problem in the absence of indigenous production of digital and high-frequency radio systems in desired quantities. But this capacity is being rapidly built up.

One of the major bottlenecks in domestic production of telecommunications equipment is the insufficient numbers of electronic components being produced in the country. Microelectronics are the basic building blocks of the new systems. The rapid growth of telecommunications services, broadcasting, home appliances, and personal computers promises to require huge quantities of electronic components, which would justify economic production of sufficient volumes. The mid-1990s' change in industrial policy could help attract new investments in this area.

2.9 Services

Plain old telephone service is the predominant telecommunications service in India, currently producing about 95% of revenues. The vast size of the country and the lack of alternatives are responsible for the still considerable volume of telegrams (about 60 million a year) and telexes (about 53,000 subscribers), although the use of both is declining significantly. It is estimated that there are over 200,000 fax machines in India. Before the growth could peak, electronic-mail services were introduced by about 10 competing private companies.

Leased lines are very expensive, hard to get, and poorly managed by the DOT, but the public network is worse. Voice and data circuits are leased to large public and private sector concerns (e.g., the Steel Authority of India, the Oil and Natural Gas Commission, the nationalized banking system, the nationalized coal mining sector, and many private firms). A large number of India-wide companies have their own VSAT-based data communications networks for speeds of up to 64 KBPS. These networks are designed, built, and operated by a number of competing private sector companies who have shared hubs. The space segment is leased mostly from domestic satellite INSAT of the government's Indian Space Research Organization (ISRO). The Planning Commission's National Informatics Center (NIC) uses a 1,000-site VSAT-based data network to connect several government offices throughout the country to the national capital in Delhi in a system called NICNET. The police and paramilitary forces have set up their own private networks. INTELSAT International Business Service facilities are provided by VSNL as network bypass systems exporters. The Department of Electronics initiated the practice of setting up Software Technology Parks (STPs), which provide high-speed digital data circuits to all the continents both by the Department of Electronics and VSNL through communication satellites and undersea cables. The setup of

these parks is now continued by private companies. Satyam Computers Services in Madras and Hyderabad, Texas Instruments in Bangalore, Datamatics Consultants in Santa Cruz, Electronics Export Processing Zone in Bombay, and Tala Consulting Services in Bombay, Madras, and Delhi are the early starters. A 600-site VSAT-based Remote Area Business Messages Network (telex, fax, e-mail, and data) and an 80-city urban packet switched data network have been launched by the DOT since 1991. The VSNL introduced telex mail boxes, electronic mail, and store-and-forward fax service for international telecommunications in the late 1980s. More extensive domestic value-added services such as voice mail, electronic mail, video conferencing, and video text are being provided by private companies.

2.10 Rates

A comparision of telephone tariffs with the wholesale price index from 1960 to 1981 shows that telephone rates were consistently low but periodically raised beginning in 1981, when the DOT was almost cut off from budgetary support and was required to generate capital funds internally. Consequently, the telephone price index has been rising faster than the wholesale price index.[2] As mentioned earlier, the per telephone wage expense in India, in relation to per capita income, is much higher than in more developed countries. Several factors have influenced the rate structure. These include the large payroll of the DOT and its inefficiency, the pressure on DOT to raise over 80–90% of the capital needed for investment in network expansion from subscribers themselves, and the perception by the socialist planners that telephones are mainly for the rich.

The proportion of per telephone revenue to per capita income, which is of the order of 0.05 in the Organization for Cooperation and Economic Development (OECD) countries, was 2.5 in India in 1951 and in the last 44 years has come down to 1.5. This statistic demonstrates that telephone service is 30 times more unaffordable for the average Indian compared with that for people in developed countries. Similarly, the charge for a one-minute call from India to the United States is more than twice that of a call going from the United States to India. On an exchange parity basis, in terms of per capita income, it is 100 times more costly for the average person in India to call the United States than for a person in the United States to call India. The leased circuits and services cost even more, having been priced far above cost. Left with little choice, customers are hoping that with the onset of competition, prices will fall and not increase year after year. Meanwhile, telegraph service remains an underpriced means of communication often used by the masses, especially in small towns and rural areas.

2.11 Changes after 1991

This chapter on Indian telecommunications would fall short without discussion of the fundamental changes that have been taking place in the telecommunications sector since 1991. A few years ago, the Department of Electronics started making

inroads into the DOT's domain as telephone switches and customer premise equipment (CPEs) (PBXs, telephones, fax machines, cordless telephones, and answering machines) came to be electronic based. The Department of Electronics started licensing the state government's Electronics Development Corporations to produce the CPEs for which it negotiated technology transfers from several foreign companies. This technology will be shared by many Indian enterprises. The CDOT began its introduction of telecommunications products—the rural switches and radio systems, for instance. Production of equipment using technologies developed by CDOT was licensed mainly to private companies. These actions undermined the DOT's orthodox view that telecommunications equipment production should be done solely by its own public sector enterprises and factories. In 1991 this orthodoxy was abandoned, and private sector companies were liberally allowed to enter into technical collaborations for all varieties of transmission equipment—radio, fiber optics, and satellites. Foreign multinationals were allowed to tender for all the DOT's purchases of switches with capacities of 10,000 lines and above. Consequently, AT&T, Siemens, Ericsson, and Fujitsu offered their switches at about 40% of the price charged by the DOT's former monopoly, state-owned ITI. After validating their switches for use in the Indian network, the companies delivered imported equipment and have quickly proceeded to set up manufacturing facilites in India. More than 20 Indian companies have begun producing transmission equipment in collaboration with foreign companies. The ending of the DOT's monopoly over production has had extraordinary benefits.

- Over 100 private companies sprang up in a matter of two to three years. During this period they invested $300 million in manufacturing, compared to the $120 million invested in 47 years by the public sector units.
- The equipment and cable shortage has disappeared. In fact, the production is limited by the sole buyer: The DOT is unable to allocate money from its budget to buy equipment.
- Competition has brought down prices by as much as 25% to 75%.
- The product quality and delivery periods have dramatically improved.

The foreign exchange crisis in 1991 and the collapse of the U.S.S.R., India's ideological inspiration, led the government of India to give up the orthodox belief that the public sector should occupy the commanding heights of the economy through state monopolies and the exclusion of the private sector from many industries. Liberalization and private sector participation have now become elements of respectable state policy. After largely unsuccessful moves to involve private companies in telecommunications networks and service provision, the government has written and presented what has come to be known as the National Telecom Policy (NTP) in May 1994. The NTP is a historic document that for the first time (without saying as much plainly) envisaged, among other things, the provision of basic telephone service by private companies in competition with the DOT, the setting up of an independent regulatory body, and the separation of operational, policy, and ministerial functions in the DOT. In September 1994 guidelines were issued for the entry of private companies into basic telephone networks and services. In

January 1995 separate bids were invited for licenses to provide basic and mobile telephone services. The salient points of the NTP are the following:

- The corporatization of the DOT is a nonissue. It would be left as it is. The labor unions have, therefore, no big issue to fight.
- Private sector companies will be issued licenses for statewide operations in competition with the DOT for basic telephones. There would thus be a duopoly system for 15 years (there are 21 statewide service areas).
- Mobile telephone services will be offered solely by non-DOT private sector companies, at least two in each service area. The initial license period is 10 years, extendable by five years at a time thereafter.
- It is essential to have foreign equity participation from public telephone operators of at least 500,000 basic telephone customers and 100,000 mobile phone customers as of 1 January 1995.
- Foreign equity participation must be a minimum of 10% and a maximum of 49% in the bidding for joint ventures, each of which must be registered as Indian companies.
- The government has laid down rollout and public service obligations like rural area coverage and public telephones.
- Prices charged should not exceed those charged by the DOT.
- Interstate and international telecommunications will be the exclusive monopoly of the DOT and its company, the Videsh Sanchar Nigam, Ltd. Competition in local markets and monopoly of long-distance telecommunications have no parallel in the world.
- Only companies with a certain minimum net worth are eligible to bid.
- Government (i.e., public sector) undertakings are ineligible to bid.

In the implementation of this NTP the government invited bids for the awarding of operating licenses for cellular, mobile, radio telephone, and basic telephone services. There would be two private companies for mobile phones in each state competing with one another and one private company for basic telephony competing with the DOT.

The DOT is not corporatized into one or more units, like the MTNL and VSNL, because the technical bureaucracy and workers are opposed to the loss of civil service status that accompanies corporatization. The labor unions have many more reasons to oppose corporatization—loss of civil service status, retrenchment (as the DOT is grossly overstaffed at 24 telephones per employee compared to 200 to 300 in the OECD countries), promotion based on seniority, extensive welfare benefits, and ideology. They also think that corporatization is the first step to privatization. As elsewhere in the world (France, Germany, the United Kingdom) the labor unions held demonstrations and waged strikes. There was not enough political will to proceed with corporatization. The government appointed a committee to suggest amendments to the Indian Telegraph Act of 1885. The committee urged in 1992 that a separate regulatory body must be set up, that customers must have certain rights, and that telecommunications services must be linearalized. Even these mild changes were not acceptable to the technocracy in the DOT, and this report, like the Athreya Committee report recommendations to corporatize, was consigned to the dustbin.

In light of the NTP, the DOT accepted from private companies bids for licenses to construct networks and provide cellular mobile radio telephones in four metropolitan cities and 21 states for mobile telephones and 27 large cities and 21 states for radio paging. The award of licenses, the interconnection terms, the license conditions, and the fees payable were all seen as arbitrary, and aggrieved parties went to court. The final awards took 33 months to be decided, and some of the services began to be rolled out in the middle of 1995. Eight private radio paging companies are licensed in 27 cities. Half a dozen companies have been licensed to provide electronic-mail service. Forty-two licenses have been given to build, operate, and provide mobile telephone services in all the states of India. As of January 1997, cellular mobile telephone services were available in four states, besides the four metropolitan cities of Calcutta, Cheenai (Madras), Delhi, and Mumbai (Bombay).

The prime criterion adopted for award of services licenses was the highest license fee offered by the bidders. This amounted to about $35 billion over a 15-year period. The DOT thought that the license fees would come to it, but the amount was so huge that the Ministry of Finance (MOF), which is in dire need of funds, held that the telecommunications license fees would be its revenue, not DOT's. The MOF may give some to DOT but only as part of its overall budgetary support to several claimants. The license fees amount to 20% to 35% of DOT's current per line annual revenues. Besides, the DOT imposed the entire cost of interconnection on the licensed private telephone companies (P-Telcos), which takes away another 8% of their revenues. Also, the P-Telcos have to pay access charges for use of the interstate and international telecommunications, which together take away another 27% of P-Telco revenues. In total, the DOT's take of the P-Telcos' revenues amounts to between 50% and 60%. When these realities dawned on the P-Telcos, they found that their projects were unfundable. No bank or financial institution, domestic or foreign, is enthusiastic for equity or debt funding for the P-Telcos. Other complicating issues of the license fees are that the licenses are not assignable by the P-Telcos to others. The license fees are allowed neither as tax-deductible expenditure nor as capital investment meriting depreciation.

The fantastic license fees tendered for basic telephone services took the DOT by surprise. While evaluating the bids, the DOT invented certain minimum license fees for each service area in the light of what one bullish company offered for 8 of the 21 service areas. It rejected all bids lower than the invented minimum, termed a reserve fee. It called for a second round of bids. The number of bidders was reduced from 16 to 11, and for some areas, there were no bids at all. The DOT then lowered the "reserve" license fee and called for a third round of bids. Fewer bidders showed interest this time. And eight areas were finally left with no taker. Meanwhile, the highest bidder for as many as nine areas in the first round seems to have realized its folly, and although in an alleged bailout (from forfeiture of hefty earnest fees and bid bonds, etc.), was limited to only four service areas. The bidder went to the judicial court to free itself from the obligation to accept any license without forfeiture of bank guarantees for bid bonds and so on, on the ground that the DOT took too long to decide anything and that the consequent delay had upset all the company's business plans. The courts have not decided this

appeal (as of January 1997), nor are they likely to decide any time soon. As a result, none of the other P-Telcos that stood to get basic telephone service licenses began the process, feeling that the demonopolization of basic service was a non-starter. The DOT has thus achieved the miracle of converting what are profitable telecommunications services everywhere else in the world to loss-making businesses for private companies in India!

The clue to this miracle is in the DOT itself. The DOT of India, which continues to be an operator, is itself the policy maker, the authority to pay the terms and conditions for licensing, the evaluator of the bids, the selector of its rivals, the arbitrator of disagreements between itself and the bidders, who are its prospective competitors, and the regulator. The DOT was prevailed upon to agree to divest itself of regulation by various foreign and domestic companies and intellectuals. But it delayed. When pressed hard, it introduced bills to create a regulator, but the provisions in the draft bills were such that no P-Telco, no analyst, and few members of Parliament could accept them as creative of a truthful regulatory body with any teeth. Eighteen months after the DOT's first attempt to create a namesake regulator, there is still not one in place as of January 1997. Cellular operators have now started rolling out services with a repertoire of issues to be referred to the unborn Telecom Regulatory Authority of India (TRAI). Also, the few P-Telcos standing to get licenses have grievances about their "agreement," including the interconnection terms and fees that had been served on them by the DOT, their rival, in the role of the Telecom Authority (licensor and regulator). In the last week of January 1997 the president signed an ordinance (not a Parliament-based law) creating a TRAI to which members would be appointed. If the ordinance is not passed by the Parliament in its budget session in February 1997, it will lapse a third time.

Elections to the Parliament in May 1996 produced a new government by a coalition of 14 parties (including two communist parties), which together has less than one-third of the 525 seats in the lower House and depends on support from the defeated Congress party (with 27% of the seats). The Standing Committee on Communications of this new Parliament has recommended a large number of amendments and additions to the proposed Telecom Regulatory Authority of India to make it less a captive of DOT, a defender and preserver of its interests, and an appendage of the ministry, and more of an independent, powerful, and fully impartial regulator.

The DOT's multifarious roles are distorting the NTP in its implementations. The obsession of the operator (DOT) to maximize revenue intake has added about 30% to the cost of service by way of license and interconnection charges. This detracts from the NTP's objective of granting licenses for P-Telcos to operate telephone services. The actions of the DOT can be construed as deliberate discrimination by the state against one set of citizens, which has already been raised as a legal issue.

The DOT has also imposed hefty license fees on providers of electronic mail, VSAT-based digital data services for closed user groups, video conferencing, voice mailbox, Internet services, EDI, and so on. These services are yet to be sold to users, and the start-up private companies are struggling to whip up a market. It is held that were the DOT a ministry only, with wire telecommunications services spun off as corporations, then it would, like the DOE, be promoting telecommuni-

cations for social and national good, using progressive, enabling, and stimulating policies. Even after taking away its regulatory duties, the DOT as a policy ministry and operator rolled into one cannot do adequate justice to promoting telecommunications. It may, like any private company, continue to lay down such policies as will maximize its own revenues, not offer service to the consumer.

But reality may turn out to be even harsher. An increasing number of people and public policy analysts are calling for an end to the monopoly of DOT/VSNL on interstate and international telecommunications. The various State Electricity Boards and the Union Government Railways are challenging DOT's restrictions as harmful to the national economy, since they prevent these groups from cost-effectively providing telecommunications infrastructure for various service providers, DOT, and the P-Telcos. They cite examples of Energis in the United Kingdom, Japan's National Railways, and the European railway's multinational HERMES project, all of which have emerged as low-cost, quick infrastructure providers for telecommunications operators.

On the whole, one can see the onset of great demonopolization in India's telecommunications. While the DOT continues to step up the rate of network expansion and add new lines, the country will soon be witnessing dozens of private companies providing a variety of new networks and services, some in competition among themselves and some in competition with DOT. The liberalism and demonopolization exercise in India has excellent lessons to other developing countries wishing a similar reform, especially in showing why a proper legal framework and a separation of licensing, regulation, and operations are prime prerequisites and why extensive debate involving customers, industry, economists, public policy makers, and entrepreneurs must be launched on a national scale to get most things right in the beginning, rather than blundering and correcting as one goes along.

The prospect of adding a hundred million telephones in the next ten years (i.e., by 2007) to bring India's current teledensity from 1.4% to 12%, the world's average in 1996, is a challenging task. To fit India's telecommunications into the global information infrastructure is an even more exciting challenge. It is hoped that the reform exercise will teach proper lessons to public policy makers.

Notes

1. DOT's annual statistics.

2. T. H. Chowdary, "Financing and Pricing of Telecommunications," *Journal of the CTMS* 7 (July 1992):5–6.

3

Institutional Reform of Sri Lankan Telecommunications: The Introduction of Competition and Regulation

ROHAN SAMARAJIVA

3.1 Introduction

Institutional reform of telecommunications in developed market economies with high rates of telephone penetration has been studied in some depth (Brock, 1981; Bolter et al., 1990; Cole, 1991; Duch, 1991; Faulhaber, 1987; Hills, 1986, 1991; Horwitz, 1989; Palmer and Tunstall, 1990; Snow, 1986), but less is known, either of the process or of the underlying causes of the process in developing countries. Writings such as those of Akwule (1991); Bruce, Cunard, and Director (1988); Hobday (1990); Horwitz (1992); Samarajiva and Shields (1989); and Sussman and Lent (1991) represent a good beginning but do not deal with the underlying causes adequately. General theoretical frameworks for explaining how policy changes diffuse or become synchronized across polities, such as those in Cox (1987) and Haas (1992), have only in few instances been applied to telecommunications reforms (e.g., Cho, 1995; Ikenberry, 1990). After a brief summary of the country's history and telecommunications beginnings, this chapter provides an analytical description of institutional reform in the telecommunications system in Sri Lanka in the 1980–1992 period and a policy analysis that addresses the internal and external reasons for the reform, its differential impact on groups in society, and the stability of the reform process.

3.2 General Background

Sri Lanka, formerly Ceylon, is an island nation with a population of 18.1 million concentrated into 65,607 sq km. It is relatively poor, with a per capita gross national product (GNP) of $713 in 1996. A former British colony, Sri Lanka has been independent since 1948. Its economic policies may be periodized as traditional plantation export-based policies (1948–1956), import-substituting industrialization policies (1956–1977), and export-oriented open economy policies (1977 to the present). The primary exports are garments and tea. Sri Lanka generally

scores high on physical quality of life (PQLI) type indexes because of relatively well-developed educational and health systems. The adult literacy rate is nearly 90%, the secondary school enrollment rate is nearly 75%, the infant mortality rate is around 17.2 per thousand, and the population growth rate is just over 1%. Sri Lanka has a tradition of civilian-led, quasi-democratic governance, with multiple political parties and more or less regular elections. Since 1983, government forces and a political and military organization claiming to represent the Tamil minority in the north and the east of the island have been engaged in a protracted civil war with regional ramifications. The capital and the main centers of commercial activity have been shielded from the war on a day-to-day basis, although there have been several spectacular terrorist attacks in the capital.

The British model of parliamentary governance, known as the Westminster model, forms the basis of the Sri Lankan political system. In this system parliament is sovereign, and there are minimal checks and balances between the legislative, executive, and judicial branches of government. The prime minister and cabinet members are members of the legislature and accountable to it. The basic Westminster Constitution adopted at independence in 1948 was substantially modified, first in 1972 and then in 1978.

The 1978 Constitution overlaid a powerful executive presidency and a potentially powerful judiciary on the basic Westminster model. The president is elected in a nationwide election, and the members of the legislature are elected in a separate election based on proportional representation. The president is not a member of the legislature but must appoint a cabinet of ministers who are members of the legislature. The president appoints the justices of the supreme court who have limited authority over legislation and can enforce fundamental rights. Partly as a result of the design of the proportional representation system, which enhanced the power of political parties at the expense of individual members, and partly due to other provisions of the Constitution, the Sri Lankan legislature is rather weak. Except for a short period in 1994, the president and the majority in the legislature have belonged to the same political party.

The 1994 elections saw the peaceful transfer of power from the United National Party (UNP) and its allies to an opposition coalition. The UNP was in power for 17 years, during which time it completely transformed the political and economic environment of the country. Through constitutional reform and clever political strategy bordering on abuse of power, the UNP consolidated political power in an unprecedented manner. It used this power to dismantle an extensive welfare state and create the conditions for market-driven economic growth policies. The People's Alliance (PA), which took office in 1994, promised to retain the economic policies of the UNP, promising only to root out corruption and put a human face on the market economy (Keerawella and Samarajiva, 1994, 1995).

3.3 Telecommunications Background

The first telephone link in Sri Lanka was established in 1880 by a British-owned company. Telegraphy, including international telegraphy, has been available since 1857. In 1896 the colonial government purchased the telephone operations of the

Oriental Telephone Company, beginning the era of government monopoly. In 1941 Cable & Wireless, the United Kingdom-based telecommunications company, took over the provision of international telephony. In 1951, three years after independence, the government repurchased the international service unit from Cable & Wireless for Rs 2.6 million. From 1951 until the beginning of the institutional reforms in the 1980s, telecommunications service was a complete government monopoly (Gnanaindran, 1992).

Until recently, telecommunications services attracted little attention and investment. In the colonial period emphasis was placed on connecting government offices. Most of the rural lines were installed to serve the plantation sector. Telephony and telegraphy were provided by the Department of Posts and Telecommunications. The extensive network of post offices primarily provided postal service, telegraphy services, and money transfer and savings account services. Telephone service was provided through separate offices but as part of the same department.

The Colombo Area Development Scheme I (CADS I), completed in 1966, which saw the installation of 23 Strowger exchanges in the metropolitan Colombo area and the introduction of subscriber trunk dialing, marks the beginning of the modern era of telecommunications in Sri Lanka. This project connected 30,000 subscribers, mostly those previously served by manual exchanges. The Department of Posts and Telecommunications completed the Outer Colombo Area Development Project I (OCADS I)[1] in 1973, equipping major cities outside the capital area with crossbar switches and establishing microwave and cable interexchange links. In 1976 the Overseas Telecommunications Service of the Department of Posts and Telecommunications established a link to the Intelsat Indian Ocean Region satellite, and the first international gateway was commissioned, providing a limited capability for international direct dialing.[2]

3.4 The Reform Process

Institutional reform of the Sri Lankan telecommunications industry began in 1980 with the separation of the Department of Telecommunications from the Post Office. Both institutions continued to report to the minister of Posts and Telecommunications. The Department of Telecommunications functioned as a normal government department, subject to limitations on the ability to hire, fire, and discipline employees; to raise funds independently; and to retain earnings for internal use.

Despite the investments outlined in the previous section, the department had difficulty in meeting demand and providing reliable service. In 1980 61,500 direct exchange lines were in operation, the total number of telephones was 82,000, and exchange capacity was 93,000, none of it digital. There were 900 telex lines (Wickramarachchi, 1992, iv). According to department sources, only 65% of the registered demand for telephone service was being satisfied at this time. The normal growth of demand had been accelerated by the open economy policies of the post-1977 period, which emphasized international and domestic commercial activity. High usage of available telephone lines contributed to difficulties in com-

pleting calls (Kojina et al., 1984, 335–338; Saunders Warford, and Wellnius, 1983, 7–8). The obsolete cable network appeared to be the primary cause of the horrendous reliability problems. The Natural Resources, Energy, and Science Authority of Sri Lanka conducted a study in the early 1980s that found that 38% of telephone lines in the Greater Colombo area were out of order at any given time (Abeynayake, 1986, 16).[3] Though referring to a later period, the managing director of Sri Lanka Telecom (SLT) corroborates the claims of unreliability by his statement that the daily average number of customer complaints regarding malfunctions was 5,000 prior to the completion of the cable modernization project in 1990 and less than 400 subsequently (Wickramarachchi, 1992, v).

Exchange fill (percentage of exchange capacity utilized) and the ratio of employees to 1,000 direct exchange lines (DEL) are common indicators of the efficiency of telecommunications administrations. In 1980 the exchange fill was 66%, a relatively unsatisfactory figure. By 1985 the fill was 64%, indicating that the new Department of Telecommunications was not improving efficiency. The number of employees was 10,238 in 1980, giving a very high employee/1,000 DEL ratio of 166. By 1985 the ratio had been reduced to 114.[4] A selected comparison of employee/1,000 DEL ratios given in a World Bank discussion paper listed India as the highest, with a ratio of 90. The lowest ratio was 0.14 for Telefonica (Spain). These ratios were for an unspecified year, apparently near the end of the 1980s (Ambrose, Hennemeyer, and Chapon, 1990, table 1).[5]

Heavy demands were made on international telecommunications services by the movement of temporary workers to the Middle East, which began in the 1970s as construction and consumption exploded in the petroleum-exporting nations. The back-and-forth movement of thousands upon thousands of workers, most of whom had never been out of the country before, created both a familiarity with the capabilities of telecommunications services and strong demand. Because of the lack of English and Arabic literacy on the part of most workers, the postal system, telex, and other modes of text-based international communication were of limited utility. The telephone and the mailed audiocassette provided solutions to their urgent and nonurgent communication needs, respectively.

Given the extremely limited facilities for international telephony then available from the Department of Telecommunications, some entrepreneurs established telecommunications bureaus, or resale centers. These centers obtained international direct-dial and telex lines from the Department of Telecommunications and provided international calls, outgoing and incoming telex services, and, by the mid-1980s, fax services to customers who came to the centers. The department did not initiate the centers but provided them with additional lines, recognizing their utility. The centers were not limited to international services; they provided local and domestic long-distance services as well, sometimes in conjunction with photocopying and postal services. The bureau business was quite lucrative, and their operators had both the wherewithal and the incentive to subvert the first-come-first-served system that governed the allocation of scarce telephone and telex connections and maintenance services. Instances of tampering with the billing system by corrupt employees of the Department of Telecommunications, whereby calls made from the centers would be fraudulently billed to other cus-

tomers, were also detected. Public disclosure of these illegal activities brought the centers into disfavor among policy makers.

Some centers had their telecommunications facilities withdrawn (Samarasinghe, 1991). In addition, the Ministry of Posts and Telecommunications began to contemplate offering telecommunications services such as fax and telex services at post offices. However, it must be emphasized that the telecommunications centers provided a flexible, customer-responsive solution to serious shortcomings in the national telecommunications system. While the accompanying corruption was a negative aspect, it was an understandable response to the chronic undersupply of connections and maintenance services.

The Department of Telecommunications continued to provide telegraphic services after separation from the Post Office. Telegraphic services are used by a more representative, and much larger, group within the population than are telephone services. Telegrams are accepted at the many post offices dotted around the country, including extremely remote areas, and deliveries are made to postal addresses by messengers on bicycles. According to data provided in UNESCO (1989, table 9.29), access to post offices in Sri Lanka is roughly equivalent to that of Italy, with one post office serving an average area of 17 square kilometers and an average of 4,294 citizens. Sri Lanka ranks fourth in Asia on area served (behind Turkey, Israel, and Japan, if micro states such as Macau are discounted), and sixth for inhabitants served (behind Turkey, Cyprus, Malaysia, Israel, and Jordan). Only 1% of the population lacks access to postal services.

The separation of the Post Office and the Department of Telecommunications affected the telegraphic service in two ways. First, its provision required inputs from the postal and telecommunications services. The receipt of messages and their delivery occurred through post offices, and postal delivery was used when delivery of messages via telegraphic/telephonic circuits proved impractical. Second, there was a general perception that telegraphic services were cross-subsidized by the more lucrative telephone services. While telephone rates were frequently increased, telegraph rates were not. In light of high inflation, this actually reduced the rates for telegraphic services. A union has claimed that the actual cost of a telegraphic message is 20 times what is actually charged (Union of Post and Telecommunication Officers, 1984, ¶6.2.1).[6]

3.5 Aborted Privatization

In 1984 a presidential committee was appointed to make recommendations on the liberalization of telecommunications. It was chaired by K. K. Gunawardene, a senior engineer who served as director of Telecommunications at the time. The other members were J. A. Gunawardene (professor of electrical engineering at the University of Peradeniya and a computing pioneer; no relation to the chair), Mohan Munasinghe (an expatriate Sri Lankan energy economist on leave from the World Bank), and K. K. Y. W. Perera (founding professor of the Department of Electronics and Telecommunications at the University of Moratuwa and former chairman

of the Ceylon Electricity Board). Their recommendations were issued as a parliamentary sessional paper.[7] The Gunawardene Report is generally recognized as the beginning of the effort to privatize the Department of Telecommunications and to introduce competition and regulation. It recommended the creation of a regulatory authority and the granting of multiple licenses to operators wishing to provide value-added services, key elements of the 1991 reform legislation discussed in the following section.[8] Several members of the Gunawardene committee continued to play key roles in subsequent policy making, maintaining a connection between the committee report and its implementation. Chairman Gunawardene oversaw the 1991 corporatization process and served as the acting director-general of Telecommunications at the inception of the regulatory authority. Professor Perera was appointed to the first board of directors of Sri Lanka Telecom in 1991.

Around the time of the Gunawardene Report, news reports and rumors of an impending sale of the Department of Telecommunications to a foreign carrier began to circulate widely. The appointment in 1986 of one of Sri Lanka's most accomplished career diplomats, Vernon Mendis, to head what was described as a "shadow board" strengthened the general perception that a foreign company was likely to take over the operations of the department upon privatization. The mandate of the "shadow board" included (1) making recommendations on restructuring the department on a commercial basis, (2) formulating proposals on the establishment of a regulatory body, (3) assessing the need for foreign investment, and (4) selecting an appropriate foreign partner (Gunasekera, 1991a). The interest in a foreign partner was driven partly by the desire to obtain access to technology, but the primary motivation was the perception that domestic capital markets were incapable of handling the privatization of an enterprise as enormous as the telecommunications monopoly.[9]

By 1987 it was widely believed that privatization would occur, with a minority ownership stake and management going to a foreign company. Cable & Wireless, a British transnational active in developing countries, was said to be the leading contender (de Silva, 1987, 75; Perera, 1986, 8; Adam, Cavendish, and Mistry, 1992, 322). Cable & Wireless holds interests in several countries, including Hong Kong, Fiji, Vanuatu, Solomans Islands, Jamaica, Barbados, St. Kitts and Nevis, Sierra Leone, and Bahrain (Ambrose, Hennemeyer, and Chapon, 1990, appendix 3). The foreign ownership issue appeared to be alive as late as June 1988, as evidenced by a speech given by the then National Security, Trade, and Shipping Minister, Lalith Athulathmudali ("Privatisation Not the Be-All and End-All—Lalith," 1988). The foreign ownership issue helped opponents of privatization in two ways. On one hand, they were able to tap into the nationalistic feelings (even if latent) of the public and media personnel. On the other hand, the issue triggered concerns regarding national security within the ruling party.

The opposition to privatization was led by trade unions representing the employees of the Telecommunications Department—the Union of Post and Telecommunication Officers (UPTO), the Telecommunications Engineers' Association, the Telecommunications Officers' Union, the All Ceylon Telecommunications Engineering Workers' Union, the National Posts and Telecommunication

Workers' Union, and the Telecommunications Clerical Services Union. They were primarily concerned by the loss of employment.[10]

The lead trade union, UPTO, made submissions to government committees, issued press releases, organized seminars, issued educational material, including a booklet, and coordinated a picketing campaign. A threat of noncooperation with the privatized entity was also issued. On 23 September 1988, President Jayawardene summoned the union leaders to a meeting. According to a union source, he gave them an assurance that there would be no privatization. According to other sources, the president only postponed the decision until after the elections, even though the bill was on the order paper (agenda) of parliament.[11]

The retreat by the Jayawardene administration, not known to be easily swayed by public opinion or by unions, requires explanation. Since the Indo-Sri Lanka agreement of July 1987, signed by Prime Minister Rajiv Gandhi and President Jayawardene, brought Indian troops onto Sri Lankan soil, the government faced a growing insurgency in the areas inhabited by the majority Sinhala ethnic group. The underground organization that led the insurgency was effectively utilizing work stoppages in conjunction with terror tactics in what was the most serious threat to state power in independent Sri Lanka. As a result, the government uncharacteristically reached accommodations with unions during this period. The postponement of the telecommunications privatization decision should be seen as part of the general defensiveness of an administration with its back to the wall (see generally, Chandraprema, 1991; Gunaratne, 1990).

Ranasinghe Premadasa, the nominee of the ruling party, but a politician with a different power base, was elected president in December 1988, and a new legislature was elected in February 1989. These elections, conducted in the midst of a massive insurgency and a civil war, were the most chaotic and violent in the country's history. Despite a political environment unconducive to debate on issues as arcane as telecommunications, UPTO obtained the views of every political party participating in the elections on privatization. All, except the tiny Liberal Party, stated they were not committed to telecommunications privatization.[12] The Premadasa administration continued with the open economy policies but was clearly more populist and perhaps more nationalistic than its predecessor. President Premadasa decided against the privatization of telecommunications in 1989 and instructed his officials to prepare legislation to corporatize the Telecommunications Department.[13] This time, the unions acquiesced, mollified by a government commitment that no employees would lose their jobs. Union demands for increased salaries and benefits were met with increases of up to 40%.[14]

3.6 The 1991 Reform

The second stage of the institutional reform of the Sri Lankan telecommunications system consists of three distinct but related processes—regulation, corporatization, and competition. The Sri Lanka Telecommunications Act, No. 25 of 1991, enacted in July 1991, is of central importance to all three processes. Parts I and II of this legislation create a regulatory authority, the Office of the Director-General

of Telecommunications (hereafter Telecom Authority), and specify the powers of that authority. Part III transfers all assets and liabilities of the Department of Telecommunications to the newly created, fully government-owned statutory corporation known as Sri Lanka Telecom (SLT) unless specifically excluded by agreement between the minister and the corporation. Part IV provides for the transfer of employees from the department to SLT. Provisions defining rights of eminent domain for telecommunications operators are set out in part V of the act. Various offenses pertaining to telecommunications and corresponding penalties are described in part VI. In the final part the powers of the minister to give directions to the regulatory authority, the powers of the government to prohibit or restrict the use of telecommunications and so on are specified. This part of the act also includes language repealing the law previously governing telecommunications in Sri Lanka, the Telecommunications Ordinance.

3.6.1 Regulation

Prior to 1991 Sri Lanka had no telecommunications regulation. The notion that a government agency entrusted with the provision of a public service would require another agency to exercise continuing oversight to prevent abuses is foreign to the Westminster model of governance. A government agency is expected to "do the right thing." If not, it is expected that Parliament will hold the responsible minister and the cabinet accountable.

Regulation is not necessitated by the mere conversion of a government department into a statutory corporation. A statutory corporation remains part of the government. Every such corporation reports to a member of the cabinet, and is thereby accountable to Parliament. Previous conversions, such as that from the Department of Government Electrical Undertakings to the Ceylon Electricity Board, were not accompanied by legislation creating a regulatory regime. Corporatization per se cannot explain the establishment of regulation.

The regulatory authority created by the act consists of one person and not multiple commissioners, as is the case in most jurisdictions. There are no provisions for ensuring the independence of its head, the director-general of Telecommunications, from the executive branch of government, despite the quasi-judicial nature of the position.[15] The director-general may be appointed and removed at will, subject only to the general safeguards applying to the public service.[16] This may not be very important since the minister of Telecommunications has extremely broad powers and can overrule a recalcitrant regulator by means short of removal from the position. For example, the minister has the power to:

- Grant or modify licenses to telecommunications operators on the recommendation of the director-general. The minister may reject such recommendation and grant a license at his or her own discretion (¶17(2), ¶18).
- Take action regarding tariffs and subsidies. The director-general can only advise (¶5(c)).
- Direct the director-general to hold public hearings on any matter (¶12).
- Issue general policy directions to the director-general (¶66).

- Direct the authority to furnish information (¶67).
- Approve rules made by the director-general. Rules made by the director-general have no authority until approved by the minister (¶68).
- Prohibit, restrict, or control telecommunications during a "public emergency or in the interests of public safety and tranquillity" (¶69).

Clearly, the Telecom Authority has little independence vis-à-vis the minister. In other areas of the Telecom Authority's duties, such as type approval of telecommunications equipment and the granting of licenses for frequency spectrum usage, the regulator's decisions can be appealed to the secretary of the minister (¶21, ¶22). It is evident that the Sri Lankan telecommunications regulatory authority is quite different from a conventional U.S. regulatory agency, which is given a degree of independence from the executive and legislative branches, since it performs judicial functions. The fairness of the Sri Lankan authority's decisions appears to be safeguarded only by the conventional Westminster principle of ministerial accountability to Parliament.

The rationale for regulatory authority is not corporatization or the need to ensure the independence of a quasi-judicial agency. The remaining rationale is that of expertise; that is, the regulatory authority is created because the executive branch seeks expert assessment of policy issues in a highly complex and rapidly changing technical field such as telecommunications. This appears to fit the Sri Lankan case. The only exceptions are the provisions regarding public hearings (¶12–¶16). The Telecom Authority's discretion to hold public hearings is quite broad, although it can be ordered to do so by the minister. The hearings are to be conducted by a panel of three officers from the Telecom Authority, one of whom may be the director-general. Hearings must be conducted in a manner consistent with natural justice, although the formal rules of the Evidence Ordinance do not apply. The committee's order, award, or direction shall be published in the *Gazette* and is final, subject to an appeal on a question of law to the Court of Appeal. Unlike all other decisions of the regulatory authority under the act, the decision of a committee conducting a public hearing is not subject either to the minister's approval or to an appeal to the secretary. Except for the lack of independence of the committee members and the absence of specific criteria for holding public hearings, the procedures appear quite similar to those of conventional regulatory hearings. Despite this single anomaly, it may be concluded that the Sri Lankan regulatory authority is a part of the executive branch, primarily acting as an expert advisory body.

3.6.2. Corporatization

In February 1990 Sri Lanka Telecom, the successor to the Department of Telecommunications, was established by an incorporation order under the provisions of the State Industrial Corporations Act (No. 49 of 1957). What the Telecommunications Act did was fill this empty shell with the assets, liabilities, and employees from the Department of Telecommunications. Five weeks after the act came into effect, the minister, on recommendation of the Telecom Authority

engendered by the act, issued a 20-year license to SLT (*The Gazette,* 1991). With these three actions, the corporatization of the government department that had provided telecommunications services in Sri Lanka since 1896 was completed.

Sri Lanka Telecom inherited a going concern, not bits and pieces of one. It was given a good start with employee morale. Those who joined the new company did so willingly, having been offered multiple employment options. Increases in salaries and benefits would have also contributed to morale. One significant burden that the SLT inherited was debt. It is responsible for repaying the major bilateral and multilateral loans to improve the network taken from the Asian Development Bank ($41 million), the World Bank ($57 million), and the Overseas Economic Cooperation Fund of Japan ($80 million), among others. The SLT is responsible for repaying the debt to the Sri Lankan government, which, in turn, is responsible for repaying the foreign lenders.[17] This arrangement may protect SLT from having to repay in foreign currency, a somewhat onerous obligation for a developing country telecommunications enterprise (Hudson and York, 1988).

Schedule 2 of the license issued to SLT specifies the range of authorized services, namely, telephone service, public telegraph service, telex service, data transmission, maritime mobile service, facsimile service, international television transmission, international photo telegram service, voice-cast transmission, IDS (satnet) service (low-volume data transmission using very small aperture satellite terminals), and INMARSAT service (*The Gazette,* 1991, schedule 2). Some of these—telephone service, public telegraph service, telex service, and INMARSAT service—were provided by the Department of Telecommunications prior to corporatization. But pay telephone service, which was provided by the department and which is explicitly referred to in the license (schedule 3, condition 10), is not included. Some of the listed services, such as data transmission and facsimile, were not offered in mid-1992.[18] Cellular telephone and paging have been left out of the license. The rationale for including data transmission service, a competitive service offered by two other operators, and not cellular telephone service and paging service, is not clear. In 1993 the ministry issued a separate cellular license to Mobiltel, a joint venture between SLT and an Australian company.

The principal license issued to SLT requires the operator to provide a public emergency call service (schedule 3, condition 6). In July 1992 almost a year after the grant of the license, such a service did not exist. These discrepancies lead to the conclusion that the license, like the entire regulatory regime, is interpreted somewhat loosely. This is quite understandable. The entire concept of telecommunications regulation is very new to the country and the SLT license was issued 36 days after the law creating the Telecom Authority was enacted.

The license, a detailed and lengthy document comprising the license proper and three schedules, includes provisions on subjects as varied as a development plan (schedule 3, condition 1), numbering plans (condition 24), and confidentiality of customer information (condition 26). It is noteworthy that no specific public service obligations such as allocating a set percentage of investment for rural areas have been imposed. This is contrary to common practice in other countries. The government of Mexico imposed specific and measurable public service obligations

and timetables for their achievements on Telmex prior to privatization (Bruce, Cunard, and Director, 1986, 433; Pérez Chavolla and Samarajiva, forthcoming).

A number of conditions directly or indirectly address competitive issues. Condition 16 prohibits anticompetitive practices, including cross-subsidy (condition 16.2) and linked sales and exclusive dealing arrangements (condition 16.4). The operator is prohibited from entering into the manufacture of telecommunications equipment by condition 18 and from entering into agreements with foreign telecommunications systems that preclude or restrict provision of international services by another operator by condition 31.

The effectiveness of these provisions can be assessed only after some specific anticompetitive practices have been adjudicated by the Telecom Authority. The delineation of jurisdiction between the Telecom Authority and the Fair Trading Commission, the agency with general authority over anticompetitive issues, is also unclear.

Condition 20 sets out the rules for changes in prices. It basically leaves changes in the prices of international calls, connections, leased lines, and miscellaneous services to the business judgment of the operator. Business and residential rentals and domestic call charges are subject to a price cap (less than or equal to rate of inflation minus two percentage points). Price cap regulation was first proposed and implemented in the United Kingdom. Its incorporation into the Sri Lankan system is another indication that the basic regulatory scheme was adapted from that put in place in the United Kingdom in the early 1980s. It appears that the basic format and language of the license has also been borrowed from Britain.

3.6.3. Competition

Though the Telecommunications Act provides the basic framework for competition, actual competition was introduced prior to its enactment. The activities of the telecommunication centers previously described were a form of rudimentary competition. More significantly, the first license for cellular service was given to Celltel Lanka Ltd. (owned 25% by Millicom of the United States, 25% by Comvik of Sweden, and 50% by local and foreign investors) under the Telecommunications Ordinance, before the new legislation of 1991. The new act states that every license issued under the repealed ordinance shall be deemed to be a license granted under the new act (¶72). Whether or not Celltel is bound to obey the Telecom Authority on matters not specifically mentioned in its license appears to be a matter of dispute. However, the Telecom Authority is likely to have difficulty in enforcing more rigorous conditions on the other cellular providers as long as Celltel remains lightly regulated.

The Celltel license and the second cellular license, given to Lanka Cellular Services (a joint venture between Singapore Telecom and the Capital Development and Investment Company) are examples of an incremental policy of privatization whereby new, specialized networks are opened up for competition and foreign investment, avoiding the controversies associated with privatization and foreign ownership of the Public Switched Telecommunication Network (PSTN). Ambrose, Hennemeyer, and Chapon (1990, 18–19) state:

> Political opposition is much less likely as these networks are largely growth markets and do not represent much of a threat to civil service and union employees of the PTT [Posts, Telegraphs, and Telephones]; the construction of such networks, moreover, does not present a threat to national security. The scale of investment is generally smaller than that required for a PTT privatization. New technologies such as cellular and satellite can sharply reduce the economic scale of projects. Required regulatory changes are minor when compared to the regulatory structure required for the government to sell off PTT assets, and to maintain national security.

The government, which awarded what was then said to be the last cellular license to SLT's joint-venture affiliate Mobiltel, awarded a fourth license to MTN Networks (Pte.), a joint venture in which Telekom Malaysia International holds 80% equity interest, in February 1994. Fierce competition between the four firms has led to explosive growth. One estimate indicated that the number of cellular phones had increased from around 3,000 at the beginning of 1994 to 23,000 by November 1994 (Gunasekera, 1994a). Five paging licenses have been issued to private companies. Four are in operation in the Colombo metropolitan area, and the fifth will serve two other cities. Two licenses have been issued for data communication and associated services to Lanka Communication Services (a joint venture of Singapore Telecom and CDIC, similar to Lanka Cellular Services) and to Electroteks (a fully local-owned company). Both these licenses exclude basic voice services. The SLT license authorizes the corporation to offer data communications services as well, but it did not offer such services under tariff at the time of writing.

Electroteks, an innovative company started up by a former Telecommunications Department engineer, has been building and maintaining data communications systems for banks since 1987, well before the Telecommunications Act. These proprietary networks comprise radio links that connect a limited number of branches and automatic teller machines of banks. The applicability of the license granted to Electroteks to provide "switched and non-switched data communication services" to the actual networks that are owned by the banks is not clear. It may well be that the bank networks require no licenses under ¶20 of the Telecommunications Act, since they are proprietary and presumably do not connect to other networks, including the PSTN. The other data communications operator appears to dominate the international data communications segment of the market, although it has been trying very hard to break into the business of providing domestic data communications services to banks. Lanka Communication Services enjoys certain tax advantages over its Sri Lankan competitor owing to its status as a foreign investor approved by the Greater Colombo Economic Commission. In addition, the local partner (holding 30%) in this joint venture is CDIC, a venture capital group formed under an IMF and Asian Development Bank initiative. The government holds 51% of its capital, with various local banks holding the balance.

Both companies deal with SLT on a day-to-day basis but appear to have encountered minimal difficulties. Lanka Communication Services assists customers in obtaining leased lines from SLT as part of their "one-stop shopping" marketing philosophy. Dial-up customers use SLT lines to get to Lanka Communication Services' three nodes. They receive two bills, one from SLT for telephone service and one from Lanka Communication Services for data communications

services. Lanka Communication Services relies on radio links as much as possible and in 1995 did not intend to lay any fiber or cable.[19] Electroteks has some colocated equipment in SLT premises, which had originally drawn some protests from the unions, but the equipment has been successfully installed and is operational.[20]

As is to be expected in a small country, Sri Lanka has no telecommunications manufacturing capability to speak of. Almost the entirety of hardware and software is from foreign suppliers, including CIT Alcatel and AT&T. Electroteks is the sole domestic manufacturer of telecommunications peripheral equipment. It began in 1980 by supplying signaling interface equipment to the Department of Telecommunications under the Colombo Area Development Scheme II. In 1983 it made a strong bid to supply Spey units (wireless components of some local loops) but settled for a joint venture arrangement with CIT Alcatel, which proved abortive in the end. Electroteks also supplied equipment for the expansion of the Sri Lankan telex network. By 1992 Electroteks had won a tender for the supply of telex network equipment to Bangladesh under a World Bank project.[21] Central Industries Ltd., a Sri Lankan firm specializing in polyvinyl chloride (PVC) conduits, has seen its profits increase dramatically because of contracts to supply conduits for buried telecommunications cables. The company doubled its output to 4,000 tonnes in 1993 and is doubling it once again in preparation for further expansion of the telecommunications network (Kodagoda, 1995).

Ambrose, Hennemeyer, and Chapon (1990, 16–28) identify three forms of privatization, other than the outright privatization of the PSTN and the carving out of specialized networks already discussed. They are (1) digital overlay networks, (2) build, operate and transfer (BOT) and revenue sharing, and (3) subcontracting of installation and operations.

Sri Lanka appears to be focusing on BOT-type strategies.[22] Subcontracting is not mentioned as a specific strategy by the government, but it has taken place. For example, cable laying in metropolitan Colombo was done by Diamei, a Japanese firm, as a subcontractor of the Telecommunications Department (Wijesekera, 1991). The publishing of telephone directories has been subcontracted to GTE directories since the early 1980s.

3.7 Privatization

Following the defeat of the United National Party at the 1994 elections, the telecommunications institutional reform process accelerated. As a result of the abortive privatization effort in 1989 and the late President Premadasa's commitment to not privatize SLT, it appeared that the corporation would go through a relatively long commercialization stage, with competition being introduced in various sectors of the industry. However, the stage was set for the easy conversion of SLT from a government corporation to a private company. Under the Conversion of Public Corporations or Government Owned Business Undertakings into Public Companies Act, No. 23 of 1987, all that is required is cabinet approval.

In August 1994 the United National Party was defeated in the parliamentary elections after 17 years in power. A new People's Alliance cabinet headed by

Chandrika Kumaratunga was sworn in by President Wijetunga. Stung by the defeat, President Wijetunga withdrew his candidacy for re-election in the presidential election scheduled for November 1994. Shortly upon assuming office, the new cabinet announced suspension of a Rs 977 million (approximately $20 million) contract with AT&T and Marubeni Corporation to install 44,200 telephone lines, claiming that the bid was Rs 200 million higher than the lowest offer. At the same time, SLT announced that it would not be able to meet the previously set target of 500,000 telephones by the end of 1995 (Reuter, 1994a).

In November 1994, following the sweeping presidential election victory of the People's Alliance candidate Kumaratunga, the new administration announced "a decision in principle to sell up to 20 percent of [SLT's] equity" to foreign and domestic buyers (Reuter, 1994b). The unions, again led by the Union of Post and Telecommunication Officers, opposed the plan, saying it would prune services and reduce the labor force, and threatened to launch a picketing campaign and then a strike if persuasion failed (Gunasekera, 1994b). By March 1995 it appeared that the privatization plans had been postponed. Rajan Asirwatham, the head of the Public Enterprise Reform Commission overseeing the privatization process, stated that the privatization of five other state-owned enterprises had priority and that SLT would not be taken up in 1995 (Reuter, 1995b). In 1996 an international consortium of telecommunications companies provided advice to the government regarding the "restructuring" and "reform" of the PTT; evidently, "privatization" is too much of a pejorative term.

In 1996, the government took a major step in the reform of the telecommunications system by awarding contracts to two consortia led by Sweden's Telia and Bell Canada Inc. Each consortium is expected to provide up to 100,000 wireless-based connections to homes and businesses by the year 2000. They are each expected to invest about $100 million and pay the government a fee of Rs 300 million ($5.7 million). This is the first time private companies have been allowed to install basic telephone lines in competition with SLT. In a separate development, SLT announced the launch of a $1 million network expansion program outside the Colombo metropolitan area with Japanese assistance (Rao, 1996).

3.8 Discussion

The Sri Lankan telecommunications system has experienced significant growth and major institutional reforms since 1980. There has been a qualitative leap in investment in telecommunications, funded by extensive multilateral and bilateral loans. At the end of 1991 the switching capacity was 159,596, an annual increase of 6.5% since 1980. Direct exchange lines had reached 125,834, showing an annual growth rate of 9.5% over the previous 11 years. The total number of telephones was said to have grown at a rate of 10.3% over the same period, to 175,000. Telex lines had grown by 7.7% since 1980 to reach 1,662. Telephone density for the country as a whole had risen from approximately 0.6 per 100 population in 1980 to 1 per 100 population in 1991. In the Colombo metropolitan area the density was 5.36 per 100 population in 1991. The unsatisfied demand (waiting

list for connections), which amounted to 35% in 1980, stood at 34.5%, a marginal improvement, indicating that demand had kept pace with the increase in telephones, which had more than doubled. In the Colombo metropolitan area, the unsatisfied demand amounted to 30%, compared to 42% in the rest of the country.[23] Exchange fill was at 79%, a distinct improvement over the 1980 figure of 66%. In 1996 cellular service received a boost when two licenses for cellular service were awarded to Lanka Bell (20% Bell Canada and Nortel, 70% TransAsia Telecom, and 10% local investors) and Telia Lanka (75% Telia, 21% Metropolitan Group, and 4% National Development Bank). Both are required to provide 40,000 lines by the year 2000. New services such as cellular telephony, paging, and data communication were available in limited areas. Still other services such as cardphones and store-and-forward fax services were on the near horizon. The country was considered a leader in the adoption of digital central office switching, with 70% digital exchange capacity.[24]

But the real story is not in these numbers—some impressive, some not. The major changes that have occurred are in policy and industrial organization. The UNP administration, which directed the reform process from 1980 to 1994, and the new PA administration have assigned high priority to telecommunications and have adopted innovative policies to that end. Where an all-encompassing and inefficient government monopoly constituted the entire system, there now exist multiple firms, likely to further increase in numbers. The former monopoly still functions like a monopoly in traditional wireline telephony but is now set on a course that promises dramatic changes to its institutional culture and perhaps its very existence. The basic agreement between the two main political parties on the nature of the changes suggests that the changes are irreversible.

At the present time it is not possible to give a complete answer to the question of why these changes occurred. Clearly, external factors have played a part. It would be foolish to ignore the contemporaneity of the Sri Lankan reforms with a worldwide wave of institutional reform (Cho, 1995). There is evidence of World Bank, Asian Development Bank, and Commonwealth Secretariat influence in the process. A key actor, the secretary of the Ministry of Posts and Telecommunications, has acknowledged that the separation of the postal and telecommunications departments had been "actively encouraged by the World Bank which agreed to provide financial assistance by way of loans for development of telecommunication services" (Gunasekera, 1991a). The former chairman of the "shadow board," the entity established to oversee the abortive privatization process from 1984 to 1989, writing in his official capacity in a World Bank–sponsored symposium proceedings stated that the problem of poor telecommunications in Sri Lanka was viewed with particular concern by international aid agencies such as the World Bank.

> Successive World Bank missions to Sri Lanka had drawn attention to this telecommunications gap and had . . . [made] proposals [that] primarily sought to bring about a total reorganization and restructuring to create a new system that would enable telecommunications to be operated along commercial lines. At the same time, these agencies showed an overt interest in privatization, and the Asia [*sic*] Development Bank held a seminar on the subject in 1985 and published the proceedings. (Mendis, 1989, 99–100)

The World Bank's interest in reform was concretely manifested through the funding of the shadow board.[25] The government bore "the modest local expenses," but "all other costs, such as those associated with foreign consultants and the employment of experts on its staff" were covered by a grant from the World Bank (Mendis, 1989, 105). The foreign consultants included the Sussex-based firm of Ewbank Preece, which formulated a telecommunications master plan.

The former colonial master, the United Kingdom, appears to have played a major role as an intellectual and ideological influence. A significant number of Sri Lanka's senior bureaucrats and politicians received their education in Britain. In addition, commonalities between the political and legal systems create the conditions for learning from Britain, and mechanisms such as the Commonwealth make such learning easy. Mendis (1989, 100) states that "the highly publicized and successful privatization of telecommunications" in Britain "fired imaginations." Adam, Cavendish, and Mistry (1992, 322), in a book sponsored by the Commonwealth Secretariat, assert that the legislation that was withdrawn at the last minute in 1989 was directly modeled on the U.K. Telecommunication Act of 1984. Even the 1991 act and the licenses issued by the Sri Lankan Telecom Authority bear strong similarities to their U.K. counterparts.

Haas (1992) describes groups of itinerant experts who share certain world views and serve as agents of policy diffusion as "epistemic communities." The flow of ideas regarding institutional reform may be usefully analyzed within this framework. In addition to the various British experts brought in through the Commonwealth Secretariat, Mohan Munasinghe, an expatriate Sri Lankan employed by the World Bank as an energy economist, played a key role in the reform process. On leave from the World Bank for approximately two years, he was one of the four members of the presidential committee appointed in 1984 to make recommendations on the liberalization of telecommunications. Although the process begun by this committee ran into difficulties in the short term, all the basic themes of the reforms embodied in the 1991 act were articulated.[26] Analysis of the role played by engineers such as K. K. Gunawardene, who chaired the presidential committee and supervised the 1991 transition as acting director-general of Telecommunications, is likely to be a fruitful area of inquiry. These senior engineers participate in the epistemic communities centered around the International Telecommunication Union both as "learners" and as "teachers" when they act as consultants to other developing countries. At the time the interviews for this case study were conducted, Gunawardene was advising the government of Nepal on telecommunications issues.

This evidence regarding external factors affecting Sri Lankan institutional reform in telecommunications should not be taken as an argument that internal factors were irrelevant. The failure of the 1984–1989 reform initiative clearly points to the weight of internal factors. Some of these internal factors were endogenous to the telecommunications system. Opposition by the unions and ambivalence regarding Chairman Mendis of the shadow board on the grounds that he was an "outsider" to the department and to the engineering profession belong to this category. Other factors were internal to Sri Lanka but exogenous to the telecommunications system. The political crisis of 1989 that gave an added edge

to union threats to strike and the concerns about national security that circulated within the ruling party belong to this category.

The unexpected acceleration of the reform process by the new People's Alliance administration in 1994 was influenced by both internal and external factors. As a result of the costly civil war in the north and the east and the profligate fiscal policies of the preceding Wijetunga administration, which tried to buy itself another term by increasing various welfare benefits, the new administration was compelled to find ways to reduce the ballooning budget deficit. In addition, the new administration had an image problem. The last time the parties that constituted the People's Alliance were in power, they followed strong import-substitution policies with emphasis on state-owned enterprises. Even though the People's Alliance campaigned on a promise to continue the market-oriented policies of 1977–1994, it appeared in late 1994 that investors continued to doubt this commitment. It appears that the early and unexpected announcement that a large number of state-owned enterprises, including SLT, would be privatized was made in order to establish the new administration's economic policy credentials with foreign and local investors.

Who will be the winners and losers in the Sri Lankan institutional reform process? Clearly, the telecommunications needs of the export/commercial economy centered in the Greater Colombo area are being met much better now than they were a decade ago. The new industrial structure and policy environment are likely to be even more responsive to this sector in the future. There is nothing inherently wrong with this. It is difficult to envisage how a small economy such as Sri Lanka's can survive without a dynamic export/commercial sector. But the long-term stability of society as a whole requires that the export/commercial sector not become disarticulated from the rest of the economy.

The inclusion of rural service objectives, albeit highly conditional, in the Telecommunications Act and the Hambantota project commenced in 1989 with Finnish aid do not, by themselves, amount to a serious effort to provide useful and innovative services to rural areas. The first of the general objectives of the act is "the provision of a reliable and efficient national and international telecommunication services . . . , including emergency services, public call box services, directory information services, maritime services, and rural services." The Hambantota project increased exchange capacity to over 4,000 lines for the Hambantota and Moneragala districts, two of the more impoverished rural districts. However, the mere expansion of service is unlikely to contribute to the well-being of the rural poor. What is needed is a creative effort to reconceptualize telecommunications service in a way that it will be of use to people in those areas (for discussion, see Samarajiva and Shields, 1990a).

The ministry's plans to offer fax and telex services through post offices could constitute such an innovative effort if properly designed. The strength of the post office network and the proven success of the telegram service point to the rich potential of text-based electronic communication systems capable of handling multiple languages and scripts. But simple introduction of fax and telex service (the latter, a dying technology) will not do if the objective is to reach the large population segment presently served by telegram service. At a minimum, the con-

venience and user-friendliness levels of telegram service must be achieved. It is possible to surpass them, using innovative technologies such as computer messaging systems capable of handling non-Roman scripts.[27]

Will the urban poor benefit from the current telecommunications policies? Under the present pricing policies it is difficult to envisage direct benefits except in terms of improved pay telephone and telecommunications bureau services and emergency services. The policy makers appear to be aware of these needs as evidenced by their inclusion in the Telecommunications Act and the SLT license. Yet, there are no indications of concerted efforts to establish an emergency service. After a slow start, progress has been made on pay telephones. By 1995, an SLT affiliate and two competitors had been licensed to provide pay telephones (Reuter, 1995a). Booths and advertisements for the services are quite visible in the metropolitan areas, although rural availability is very low.

Direct benefits to various groups in society are important, but they are not the sole criteria applicable to policy assessment. Research on the relation between telecommunications and development assigns great importance to indirect benefits. Indeed, there may be merit in giving priority to productive (as opposed to consumptive) uses of telecommunications, since they are the primary sources of indirect benefits such as job creation (for discussion, see Samarajiva and Shields, 1989, 1990b). If the export/commercial sector is considered to be an essential part of the economy and a provider of employment, a carefully designed emphasis on telecommunications investment in that sector could yield benefits for other sectors of the economy including the rural and urban poor. But a blatant bias toward business users will not sit too well with the vocal middle class or with the poor majority who vote, and who on occasion express their displeasure by setting fire to telephone exchanges. As a result, few policy makers take this rational, but politically difficult, course (for discussion see Samarajiva, 1991).

A politically viable policy may have to include investment in the productive sector to generate indirect benefits such as employment, investment that will directly benefit the rural and urban poor to help manage the stresses and strains of uneven development, and provision of services to the politically articulate urban middle class to build support for telecommunications policy and to generate revenues. The problem with these types of pragmatic policies is that the powerful beneficiaries (business and the urban middle class) tend gradually to elbow out the weaker beneficiaries (rural and urban poor) over time. The latter groups end up providing legitimacy to the policy but receive little or nothing in return. One possible solution to this problem is to cede the provision of telecommunications services to business and the urban middle class to private entrepreneurs or at least a structurally separate entity or entities in the public sector and to establish one or more enterprises whose *raison d'être* is the provision of telecommunications services to the urban and rural poor. There is no necessary reason for these entities to be state owned or to provide services below cost, though government incentives at the start would be required.

The Telecom Authority has been established to ensure, among other things, fair treatment of consumers and fair competition among the operators. Given its constitution, expecting fairness of a judicial nature may be unrealistic. However,

political control over the Telecom Authority may, in its own way, deliver a form of fairness. This is more likely in the case of operator-customer relations than in the case of operator-operator relations. Customers of telecommunications services in a low-penetration system like Sri Lanka tend to have privileged access to channels of political power. At least in the near future, this group should be capable of exerting political pressure on the Telecom Authority to balance their interests and those of the operators. In the case of operator-operator relations, the political nature of the regulatory process is likely to lead not to equity but to bribery and corruption. The lack of administrative procedures and due process requirements (other than the general requirement to follow the principles of natural justice) is likely to reinforce this tendency.

This chapter has provided an analytical description of the 1991 institutional reform of the Sri Lankan telecommunications system, including its antecedents in the 1980–1989 period. It has assessed the extant policies and has analyzed the interplay of domestic and external forces in the shaping of the reform process and the impact (or lack thereof) on different groups in society. It concludes that the reform process is basically irreversible in light of the bipartisan endorsement of the reform policies and the introduction of new stakeholders. Having emerged from obscurity in the past 15 years, the telecommunications sector in Sri Lanka is unlikely to revert to the backwaters it occupied in its first 100 years.

Notes

The author is grateful to Pushpa Amarasiri (Chief Legal Officer, Sri Lanka Telecom), Lal Gamage (Member of Parliament), A. D. V. N. Kurlaratne (Principal Research Engineer, Arthur C. Clarke Centre for Modern Technologies), and Professor V. K. Samaranayake (Chairman, Computer and Information Technology Council), for helping arrange interviews at short notice, and to the many individuals (not all mentioned in the chapter) who generously stated their knowledge and provided data. The 1991–1992 Ameritech Prize awarded by the Graduate School of the Ohio State University provided part of the travel funds. The views expressed in this article and any errors of fact are entirely the responsibility of the author.

1. "Outer Colombo" means the entire country, excluding the metropolitan area of the capital. This usage is indicative of the disproportionate importance assigned to Greater Colombo within the telecommunications administration.

2. Wickramarachchi (1992, iv) and Gnanaindran (1992). Wickramarachchi was the managing director of Sri Lanka Telecom, and Gnanaindran, the deputy general manager (Corporate Planning). International telecommunication via cable was available prior to 1976, but channels and quality were limited.

3. The 38% failure rate is also mentioned in a highly critical commentary on the telecommunications service in an authoritative annual government publication (National Planning Division, 1985, ¶6.27).

4. Calculated from data in Department of Telecommunications (c1986), and in Wickramarachchi (1992, v).

5. Saunders, Warford, and Wellenius (1983, p. 68) caution that this ratio should be carefully interpreted: "In the United States, where, until recently, almost 40% of the local plant [was] . . . labor-intensive step-by-step equipment, the ratio . . . is less than six and approaches four. . . . Many developing countries still have substantial open wire line net-

works that require relatively high maintenance and some manual exchanges that require operators, and some countries have relatively large workshop and construction crews because of a lack of local equipment, contractors, and suppliers."

6. Interestingly, none of the government documents examined in this research made reference to telegraphy, with the sole exception of a 1981–1985 table of revenues by service type. The fact that the telegraphic revenues as a proportion of total revenues of the Department of Telecommunications ranged from a high of 3.9% in 1982 to a low of 0.9% in 1984 may explain the neglect (Department of Telecommunications, c1986, 123).

7. Sessional Paper III of 1985. Unfortunately, this document is unavailable at the Government Publications Bureau and, inexplicably, at the Government Archives as well.

8. Interview with Professor K. K. Y. W. Perera, member of the board, Sri Lanka Telecom, 7 July 1992.

9. Adam, Cavendish, and Mistry (1992, 313) and discussions between the author and Dr. Vernon Mendis in 1987 (see also, Gunasekera, 1991b).

10. For a general discussion of union views of telecommunications reforms, see Mosco and Zureik, 1988.

11. Interview with G. M. A. de Silva, general secretary, Union of Post and Telecommunication Officers, 9 July 1992 (no privatization); interview with S. L. D. Bandaranayake, legal consultant to the Ministry of Posts and Telecommunications, and Radley Dissanayake, associate expert, licensing and customer services, Office of the Director-General of Telecommunications, 8 July 1992 (postponement only).

12. Interview with G. M. A. de Silva, general secretary, Union of Post and Telecommunication Officers, 9 July 1992.

13. Letter from A. de Z. Gunasekera, secretary, Ministry of Posts and Telecommunications, dated 15 August 1992.

14. Interview with G. M. A. de Silva, general secretary, Union of Post and Telecommunication Officers, 9 July 1992.

15. In a speech entitled "New Era in Sri Lanka Telecommunications," delivered on 23 March 1992, A. de Z. Gunasekera, secretary, Ministry of Posts and Telecommunications, described the Telecom Authority as having quasi-judicial powers.

16. Chapter 9 of the Constitution specifies the terms and conditions of public service employment. Appointment, transfer, dismissal, or disciplinary control of public officers is shielded to a great extent from judicial review. Precedent and custom makes dismissal from the public service rather difficult, but transfer is a different matter. A public officer who falls into disfavor with his or her minister is likely to be exiled into the "Siberia" of the public service, retaining title and salary but stripped of power, perks, and promotional prospects.

17. Letter from A. de Z. Gunasekera, secretary, Ministry of Posts and Telecommunications, dated 15 August 1992.

18. Complete set of tariffs listed in Department of Telecommunications (c1986, 136–151). It is possible, but unlikely, that tariffs for these services were added in 1985–1991. The only new service added during that period appears to have been the IDS (satnet) service ("Sri Lanka to Introduce New International Data Service," 1988).

19. Interview with Numinda Jayasuriya, marketing director, Lanka Communication Services (Pvt) Ltd., 9 July 1992.

20. Interview with B. A. C. Abeywardene, managing director, Electroteks, 11 July 1992.

21. Ibid.

22. Interviews with A. de Z. Gunasekera, secretary, Ministry of Posts and Telecommunications, and S. Ediriweera, director of telecommunications and director of policy planning, Ministry of Posts and Telecommunications, 10 July 1992. BOT has been used in

highway construction in Malaysia. For an assessment see Adam, Cavendish, and Mistry (1992, 211–272).

23. Calculated from Wickramarachchi (1992, iv) and notes from interview with C. Gnanaindran, deputy general manager (corporate planning), Sri Lanka Telecom, 10 July 1992.

24. The "leader" designation comes from Antonelli (1991, 49–50). Antonelli used a 1987 digitalization figure of 57.4% for 1987. Wickramarachchi (1992, iv) gives a figure of 70% for 1991.

25. This "independent" board, headed by a former career diplomat, which included representatives of the Ministry of Posts and Telecommunications and the Department of Telecommunications, was to oversee the transition to privatization.

26. Interview with Professor K. K. Y. W. Perera, member of the board, Sri Lanka Telecom, 7 July 1992.

27. For example, Gupta and Ramani (1981). The capabilities of these systems with respect to Sinhala and Tamil scripts are dramatically higher now (e.g., Kumarasena, 1988).

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