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**Structure of the Telecommunications
Sector in Pakistan**

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Telecommunications equipment in Pakistan was both imported and locally produced. After independence in 1947, the first major development in the telecommunications system occurred in 1952, with the establishment of in-country production facilities. Telephone Industries of Pakistan (TIP) was set up in Hazara in northern Pakistan, as a joint venture between Siemens AG of Germany and the GOP. Equity shares have varied, beginning with 49% and 51% respectively.¹ Siemens share went down to 16% by 1985, but has been around 25% since 1988, after infusion of fresh funds. Siemens has been intimately involved with telecommunications development in Pakistan; and for many years enjoyed a monopoly in equipment manufacture. The TIP was probably the first international venture by Siemens in the post-war years. Siemens was selected by the GOP after an extended exercise, because of the high quality reputation of German industry and, according to some sources, to move away from the colonial orientation towards Great Britain.

TIP produced assorted electromechanical equipment for exchanges and telephone lines for T&T. TIP later converted to production of some electronic equipment, though electromechanical technology was also retained. Among TIP's products were electromechanical switching equipment (EMD), telephone sets, trunk exchanges, private automatic exchanges, and teleprinters. Manual exchanges were first produced, and are still under production. Then came the automatic exchanges, initially first generation and from the mid-1960s the second generation exchanges. Also, telecommunications equipment for Pakistan's defence forces, like field telephones and exchanges, has throughout been produced at TIP. The location of TIP in the wholly non-industrial region of Hazara has been ascribed to the fact that it was the home of two influential brothers, Sardar Bahadur Khan, then Minister of Defence, and General Ayub Khan, the army chief who later became Pakistan's military dictator from 1958-69. TIP had a workforce of around 3,500 people. Apart

from other products, it had an annual manufacturing capacity of 250,000 telephone sets and 210,000 digital public exchange lines annually.² The most recent capacity addition to TIP was a German-assisted factory for the local manufacture of digital switching equipment, for which production commenced in 1989. This factory supplied TIP with digital switching equipment for 100,000 lines. Presently, TIP plans to expand production of electromechanical equipment to a further 50,000 lines. This reflects the assumption that T&T will not be able to begin phasing out this type of equipment until the late 1990s. Indeed electromechanical equipment currently accounts for 90% of T&T's installed exchange capacity.³

The GOP and Siemens initiated a second joint venture in 1969, called Carrier Telephone Industries (CTI). Equity shares were 53% and 47% respectively. CTI manufactured carrier multiplex equipment, voice frequency telegraph, ultrahigh frequency (UHF) multichannel radio transmission systems, and electronic components.⁴ CTI continued to update its product spectrum and manufacturing facilities. It progressed to manufacturing digital microwave equipment, optical line equipment and digital multiplex systems. Equipment was produced under license not only from Siemens AG of Germany, but also Databit (USA) and GTE (Italy). Equipment was also developed by CTI's own R&D, for which it claims strong facilities: the worker to engineer ratio is put at 3:1. For its future product profile, CTI intends to go heavily into digital microwave (broad and narrow bands and rural), as well as optical fibre, cellular mobile and switching systems. Both TIP and CTI had Managing Directors appointed by T&T, but Siemens consultants and engineers worked closely with them.

In addition to Siemens, two other companies have been involved with equipment manufacture: LF Ericsson of Sweden and CIT Alcatel of France. Ericsson has installed several digital exchanges and supplied a diverse range of

telecommunications equipment in Pakistan over the past 20 years. It has also obtained one of the recent BLT contracts.⁵ Alcatel's involvement began in the late 1980s, when the GOP decided not to rely solely on Siemens, and to have a second supplier. An international tender was floated, in which Siemens was not allowed to participate. That tender was won by Alcatel, which like Siemens before it was required to set up a production unit in Pakistan, though this has not been undertaken yet. Alcatel's partner in Pakistan is the Agha Khan Foundation. The US\$ 20 million project will involve manufacture of Alcatel's E-10B digital telephone switching, as well as 120,000 lines per year. A US\$ 40 million contract has also been awarded to Ataltel Telematica of Italy for the local production of 1.5 million of electronic telephone sets over five years.⁶ NEC of Japan has also installed switching and exchange equipment in Pakistan. The recent entry of Daewoo of South Korea for a BLT contract will bring further diversity to the network.

There is a feeling in the industry that these multiple systems will create inefficiencies and problems of standardization in the future. Most advanced countries have not adopted more than two systems, and Pakistan might have to cope with five or even more. Daewoo has apparently never installed a complete exchange line system, and indeed PTC is said to be resisting its inclusion. However, the company appears to have strong support from some influential members of the government. The World Bank is also said to be opposed to allowing five separate systems. Be that as it may, the BLT option, with its suppliers' credit, is an effort to overcome the financial constraints that were responsible for slow growth rates in the past. It is also an effort to move out of dependence on agencies like the World Bank and the Asian Development Bank, which have already funded several projects.⁷ Significantly, USAID, which has been the most prominent aid agency in Pakistan, has never been directly involved with telecommunications development in the

country. The BLT schemes, like the earlier Siemens ventures, are accompanied by soft loan arrangements from the parent governments. This financing factor is one source of the system's diversity. The contract to Alcatel was awarded consequent to a visit to Pakistan by Mr Mitterand, the French President. Moreover, the contract for a major fibre optic link was awarded to Telecom Australia, consequent to a visit by Mr. Bob Hawke, then Prime Minister of Australia.

Another firm in this sector, set up and owned by the government, was the National Radio and Telecommunication Corporation (NRTC). Established in 1965-66 near Islamabad, NRTC produced professional, field radio and telecommunications equipment, primarily for the military.⁸ NRTC throughout collaborated with foreign companies for its products, which were mainly as follows (with source of collaboration in parenthesis): VHF/UHF transceiver equipment (NEC, Japan), HF SSB transceiver and high power configuration (LMT, France), VHF solid state transceivers (CE, USA), rural single channel VHF radio telephones (STORNO, Denmark), VHF Synthesized transceivers and ancillaries (Telemobile, USA; and Aselsan, Turkey). In the pipeline are projects for digital microwave radio links (EB-Nera, Norway), time division multi-access (TDMA) for rural telecommunications (Telettra, Spain), radio relay equipment (Marconi, Canada) and field radios (Aselsan, Turkey).⁹

The private sector in telecommunications has been far weaker than the state-owned sector. Public and governmental monopolies have dominated telecommunications. There have been several joint ventures and collaborative programs with foreign companies from a number of countries, but again these have been within the public sector. T&T was a government department, and was run like one, and this was the monopoly operator. T&T's conversion to FTC is said to have been only a superficial transition. Nevertheless, the past decade has seen a greater receptivity towards

increasing private sector involvement. Such aims were incorporated into the Sixth and Seventh Plans, though with few results. It is expected that deregulation will create more opportunities for private enterprise, and currently even the privatization of PTC has been mooted.

The shortcomings in telecommunications have been compounded by the weakness of the electronics industry, which lacks any sizeable production unit in the country, other than assembly operations for certain electronics consumer goods. Pakistan lacks the capability of any kind of chip manufacture, or any production facilities for computer hardware. The electronics boom in east Asia has not been echoed here. At the time when Pakistan might have kept abreast of this emerging industry, the government failed to liberalise imports of electronics components for stimulating local manufacture. Prior to 1970 the electronics industry was not recognised as qualifying for any import duty concessions. On components like transistors and diodes, a customs duty of 102.5% was levied, and on computers 47.5%, in addition to sales tax.¹⁰ In 1970 customs duty exemption was granted on some imported items used in local manufacture, provided evidence of consumption was produced within six months of import. This period proved too short in many cases, but all efforts to have it extended failed. Such examples of official indifference revealed the government's failure to realise the scope and potential of the electronics industry. Again no special exemptions were granted to electronics between 1971 and 1984. After 1985, under more liberal import policies, duty and sales tax exemptions and reductions on a number of electronics items have been instituted, but the system is still fraught with bureaucratic interference.

Computer imports were similarly retarded. Pakistan's first computer, an **IBM** 1401, was installed in 1964. By 1979 the country had a mere 14 minicomputers; and by 1984 only 103, of which 68 were IBMs. Till 1979, a computer could only be imported

after an exhaustive review by a Mechanization Committee of the GOP. Import duties and controls were relaxed in 1982, and removed by 1984.¹¹ Since 1985 there has been a more rapid increase in computer sales, and several service companies have been established. IBM's earlier domination has been diluted. The lower end, microcomputer market has seen the entry of producers from eastern Asia. Among the larger machines NCR has some strength in banking; while DEC has made important inroads, with orders from such public agencies as WAPDA and the Census Bureau. DEC and NCR work through country representative firms. IBM at first marketed directly through its own sales organization. It now uses its sales force to support a two-fold distribution channel. This comprises authorised dealers for PCs; while for minicomputers it has general marketing agents that also sell or develop related software. These developments, however, have yet to lead to computer manufacturing capabilities in Pakistan.

Despite the strategies proposed by the government in its five year plans, the electronics industry failed to establish a notable presence in the country. As an example, not a single company quoted on Pakistan's stock exchange has electronics as a main business area. Since the mid-1980s the country has seen a boom in cotton textiles. Most of this investment has occurred in the low value added spinning sector, and only secondarily in weaving capacity and in made-ups. The seemingly more 'complex'¹ operations entailed in electronics manufacture have appeared beyond the abilities of the Pakistani entrepreneur. Several private companies do operate in telecommunications. A host of companies cater either on their own account or as representatives of foreign companies, to the procurement needs of PTC, TIP and CTI. Components and raw materials are not a Siemens monopoly, and these are normally obtained by tender through indenting agents, which are mostly family owned companies whose proprietors enjoy service, kinship or pecuniary links with

procurement officials in the manufacturing organizations.

Pakistan does have some firms that assemble such products as small PABXs, intercom sets and VHF radio telephones. Among the more notable is Digital Communications. Headquartered in Karachi, this company pioneered the development of PABX in Pakistan. It employs 450 people and can produce over 50,000 lines per year.¹³ Its products include specialised software for telecom, small-sized message switches, plug-in cards for PCs, telephone sets and key systems. In 1989 Digital was given a national paging license by GOP, and presently has a monopoly on this facility. It is said that the license was given at the time of Ms Benazir Bhutto's government, because of Digital's close links with the Peoples Party. Two other producers of PABXs are Native Enterprises and Innovative Ltd. Another company, Microelectronics International (MEI), at Lahore, has virtually ceased production, though efforts are said to be in progress to revive operations.¹⁴ MEI produced electronics equipment for the defence services, and tried unsuccessfully to enter the PC and VCR markets. Sipka Manufacturing of Karachi assembles radio-telephones under license from Motorola and Radios of USA. It provides mobile telephones, radio telephones and alarm systems, and has a workforce of 70 people. Some satellite TV antenna and receiver manufacturers exist, such as Video Shack, Aghaz and Wavetech. Among others active in electronics, but with potential for telecommunications equipment manufacture, are: Precision Engineering, Micropole, Margalla Electronics, Solid State Systems, Al-Teknite, Institute of Optronics, Hybrid Technologies, and Arfeen International.¹⁵

A telecommunications cable company was set up in the private sector and began production in 1986. This was Pakistan Telephone Cables. The need for such a unit was acknowledged in the Sixth Plan, and credit funds were arranged from the Asian Development Bank.¹⁶ The company was sponsored by the Bawany business group.

However, by 1988 the management had been transferred to another entrepreneur, a Mr. A.A. Alrae. From the start, the company faced adverse marketing conditions, owing to competition from foreign suppliers. Production has been suspended since 1988, following a lack of orders. A public share subscription was floated, but presently the share price stands well below its par value of Rs 10, while the per share losses in 1987, 1988 and 1989 were Rs 3.43, Rs 7.90 and Rs 13.80 respectively.¹⁷

The laying of the optical fibre cable link between Karachi and Islamabad also brought in international participation. The contract was awarded to a joint venture between Telecom Australia (International) (TAI) and the Olex division of the Pacific Dunlop Corporation. Olex's role was to provide the cables, while TAI managed the project. This contract was worth US\$ 25 million, and 2,000 km of cable will be laid.¹⁸ The project experienced substantial delays; and completion is planned for 1992. The optical fibre link, or even installing the most modern exchanges, might not improve the quality of service until the quality of exchange to unit outlets was improved from its present unsatisfactory level. Nevertheless, the link will greatly boost capacity, and allow for increased data transmission services. This 140 Mbit system will replace the old coaxial cable. A second fibre optic link is also under consideration to the west of the Indus River.

Telecom Australia has developed a reputation of innovative design, and has benefitted from being a 'second mover' in adopting new telecommunications technology from the advanced industrial nations. TAI has been awarded over 200 contracts in around 40 countries, including the prestigious project of managing the telecommunications network in Saudi Arabia.¹⁹ However, in Pakistan TAI's experience has not been an entirely positive one. It will not make a profit on the optical fibre project, which might dissuade it from further involvement with Pakistan. The perceptions of TAI personnel regarding their work in Pakistan are

highly instructive. TAI project managers have complained of excessive interference and obstruction by PTC, whose top management they found to be satisfactory, but the middle management was of very low quality. They felt that PTC lacked depth of training: TAI's technicians seemed to be more knowledgeable than PTC's senior managers.²⁰ PTC did not do proper network design, and it lacked proper strategic planning. The project has a large training component, with 650 man weeks of training in Australia, plus 450 man weeks in Pakistan, as well as field training. However, PTC rather than TAI selected the trainees, and it did not agree to proper performance evaluation. The 'headaches' that TAI has had with PTC, such that its managers regard the completion of the project as a 'miracle', might act as an unfavourable precedent for PTC's collaboration with foreign companies. On the other hand, TAI could regard this first project as an important learning curve for future contracts in Pakistan. TAI would also be a contender in any divestment of operations to the private sector.

An innovation in telecommunications, and an important new area for private enterprise, occurred with the introduction of cellular, mobile systems in the country. The GOP decided to open this segment to the private sector, and this was the first major departure from the public sector's operating monopoly over telecommunications in Pakistan.²¹ Presently, there are two operators, under license from the GOP: Paktel and Pakcom. Unlike other cellular operations these two companies also sell user equipment, owing to the infancy of the industry. In time, mobile telephones will be sold by distributors and retailers, with these two companies remaining as system operators.

Paktel is a joint venture between Cable and Wireless (C&W) of UK, with 80% equity, and a Pakistani businessman, Mr Farooq Hassan, who has a minority share of 20%. C&W also handles Paktel management. The company has two mobile switching

centres (MSC), obtained from Ericsson. The MSCs have a capacity of 65,000 lines each, and are located at Karachi and Lahore.²² Paktel has 17 radio base stations (RBS) providing coverage to all major cities. It is the first to have achieved this national coverage, which it feels will give it a critical advantage over Pakcom.²³ Paktel is currently the larger of the two companies, claiming to enjoy an 80% market share. The entry into Pakistan fitted well with C&W's global strategy. The company had traditionally been well represented in the Middle East.²⁴ It had been seeking opportunities for cellular ventures abroad, since the cellular market was maturing in the UK C&W's presence in Pakistan might also be advantageous for it in the event of a PTC privatization. C&W is certainly one of the potential purchasers, though it might have to collaborate with other large international companies because of the size of the PTC system. Paktel operations in their own right have appeal: the company was able to declare a profit in the second year of operations. However, in 1992 it ran into major deficits, largely owing to uncollected bills from errant customers. It is said to have been bailed out through a US\$ 5 million fund injection from the parent company.

Pakcom, which operates under the brand name 'Instaphone', is a joint venture between Millicom International Cellular (MIC), based in Luxembourg, and Arfeen International, a Pakistani firm. Each has a 50% equity share. MIC was incorporated in January 1991, with the merger of Millicom International Holdings Ltd. of USA and a sister company, Comvile International AB of Sweden. Comvile had previously been a subsidiary of Industriforvaltnings Kinnevik of Sweden, which had the major shareholding in the Asian operations, while Millicom handled the Central and South American operations. MIC now has cellular operations, through subsidiary companies, in several countries.²⁵ Arfeen International, the local partners, has been involved with cement, chemicals and telecommunication businesses.²⁶ Pakcom has

two MSCs from Ericsson, located at Karachi and Islamabad. It has eight RBSs, currently servicing Karachi and Islamabad, with plans for expansion to Peshawar and Quetta.²⁷ Pakcom's weakness in relation to Paktel is that it has still to enter the sizeable central Pakistan market, based around Lahore. It intends to do so later in 1992, but till then will be confined to southern and northern Pakistan. Since national coverage is important in this business, Paktel is presently enjoying a distinct edge over Pakcom, though in the future the intensity of competition is likely to increase when both achieve nation-wide coverage.

The two companies were given licenses for cellular operations by the GOP, on the understanding that their duopoly would prevail for 15 years. However, in 1991 the government granted a third cellular license, to Pakistan Mobile Communications Limited. PMCL was a local company but with foreign backing, and it was headed by the family of a federal minister, who was also the son-in-law of the President of Pakistan. Paktel and Pakcom protested to the government, and also took the issue to the law courts. In response to criticism in the local press over the seeming nepotism, PMCL has argued that it was actually the first company to make an unsolicited proposal to the then T&T Department, in 1985-86, to establish and operate a pilot cellular phone project in the federal capital area.²⁸ At that time private telecommunications operating companies were not being envisaged by the GOP. In 1989 T&T first called for an expression of interest for cellular systems, and there were about 13 respondents. Of these only Paktel and PMCL were shortlisted. The Peoples Party government of Ms Benazir Bhutto removed PMCL from consideration. Licenses were subsequently issued to Paktel and Pakcom. PMCL appealed for redress to the office of the ombudsman, who requested the government to settle the matter amicably. Finally, in August 1991, PMCL obtained the third license. This confusion in the cellular business, at its very infancy, provides an

instructive case of the interface of market forces, political patronage and legality in a lesser developed country such as Pakistan.

Ultimately, this controversy in the cellular segment might well be determined by market forces. PMCL has conceded a lead of over a year to its two rivals. If it attempts a nation-wide network it will face major barriers to entry from marketing, service and coverage strengths gained by the two existing competitors.²⁹ If it maintains a regional focus it might lose market acceptance because of inadequate coverage. A further complicating factor is that PMCL is on a different system from the other two, and the two systems cannot link up. PMCL is on ETACS, or Total Access Communication System, while Paktel and Pakcom are on AMPS, or Advanced Mobile Phone System.³⁰ To avoid such confusion, the government could have provided standardised specifications, as well as consistent investment and licensing criteria. System diversity, which is now emerging in the wider telecommunications network, leads to differences in equipment, protocols, styles and training. Uncertainty or ineptitude in government policy will make it all the more difficult to combine this disparate network into a cohesive system. Another example of weak policy-making could be the recent decision to grant card phone licenses to 22 different companies. Such concessions might only be motivated by the government's need for short term political benefits.

With the increasing complexity in the telecommunications environment, an urgent need exists to establish a proper regulatory mechanism. Especially in a foreseeable situation where the state-run enterprise will not monopolise telecommunications operations, the requirement for a clearly defined regulatory authority is necessary. Such a body can provide clearly defined guidelines under which private and public enterprises can operate smoothly. Presently, the only office approximating such a function is the Government Inspector of Telephone and Telegraph (GITT). This

office is placed within the Ministry of Communications, and the incumbents have been T&T engineers, without both the powers and the capabilities to perform an adequate regulatory role. The controversy over cellular licensing signals the need for clearer formulation of sector policy: its absence can have adverse effects for both foreign investment and system efficiency. The first major reform has already occurred: the transition from T&T to PTC.

Over the years T&T as a government department essentially remained subordinated to the Ministry of Communications, and to needs of some other ministries, most importantly Finance. T&T was headed by a Director-General, who was invariably an engineer. The ministries were controlled by the federal bureaucracy, known as the civil service, which had inherited the mantle of authority from British colonial administrators. These were generalists who were nominally accountable to the political government, but in practice exercised considerable authority, especially during the extended periods of non-democratic, military rule. The army, as a major user and because of the strategic importance of telecommunications, has been the other source of influence on this sector. Other than that external influence in the work of the T&T was rare. Engineers were recruited through the federal public service commission. They took a central engineering examination, which also recruited for the Public Works Department and Pakistan Railways. If successful, they joined the central engineering services as class I officers.³¹ They were tied to government salary scales, which were without an incentive structure designed for efficient operations.

The structure of T&T was not unlike other government departments. Under the Director-General was a Financial Advisor, as well as six major departments, each under a chief engineer. The network itself was divided into eight telephone regions,

each under a General Manager. These regions were Karachi, Southern, Central, Lahore, Islamabad, Northern, Western and Overseas. Finally, there were six special services divisions, each under a director. One of these was the Central Telephone Research Laboratory, established in Islamabad in 1980 through Japanese assistance. Its predecessor was the Telecom Research Centre at Haripur, established in 1964. The goal was to provide in-house design capability and conduct applied research work. CTRL failed to maintain a dedicated research staff, and operated through T&T engineers on transfer.³² This adversely affected the quality of work: over the years the centre has failed to deliver indigenous research impetus for telecommunications in Pakistan.

The transition from T&T to PTC was first attempted through legislative enactment. By the mid-1980s the GOP was committed to deregulating telecommunications, in order to make the sector more efficient and more responsive to market needs. One option was to open up greater spheres of activity for the private sector, as in the supply of outside plant and mobile systems. The other avenue was to establish PTC as an autonomous corporation, wholly owned by the GOP, but with prospects of privatization at some future date. An impetus for converting T&T to a corporation came from within T&T itself, with a general realization that corporatization would bring an improvement in services and performance. More rapid expansion would also be possible, especially with a retention of net profits within the corporation, rather than their transfer to the public treasury. One major implication of this transition was that it could clear the way for eventual privatization. Before discussing these implications, let us examine the legal context under which this sector operates.

Several laws affect the telecommunications sector. As a telling legacy of colonial rule, the governing law for telecommunications in Pakistan was the Telegraph Act of 1885. There were subsequent amendments to the act, but these were cosmetic.

Examples were the inclusion of the term 'telephone', or 'Pakistan' instead of 'India' where required. Another regulatory act still extant was the Wireless Telegraphy Act of 1933.³³ A new PTC Bill had a reading in the country's national assembly, but was still to be enacted. The drafting of the required legislation began in 1986. A bill to establish the corporation was first submitted to the national assembly in 1987. Political changes, however, continued to impede legislative action. There were almost annual changes of government since 1988. During this period the bill was debated in parliament and referred to select committees. By November 1991 the PTC Bill had been adopted by both parliamentary houses, the national assembly and the senate.³⁴ Meanwhile, PTC was established through a presidential order on December 15, 1990.³⁵ This measure is known as Ordinance No. X of 1991, or the Pakistan Telecommunications Ordinance, 1991. Another important law that affects the telecommunications sector is the Companies Act of 1984, under whose stipulations private and public limited firms operate in Pakistan. For foreign companies the regulating law is the Foreign Private Investment (Promotion and Protection) Act, 1976. Repatriation of profits is still formally subject to the provisions of the Foreign Exchange Regulation Act, 1947. However, government controls over foreign investment, as well as currency conversion and repatriation of profits and capital, have been considerably liberalised since 1991, in order to provide investment incentives.

A substantive change with the new corporation will be the internal retention of its net profits. T&T's overall financial performance has been good. In recent years it has consistently achieved rates of return on revalued assets of around 25%. T&T was for years a heavy net revenue payer to the national exchequer. These contributions would now be retained by PTC in the form of cash surpluses. They would exceed the substantial sums that the PTC would still have to contribute to the GOP for debt

service payments and dividends. One source put the amount PTC will pay the GOP annually for the latter's investment in the system at Rs 7.6 billion.³⁶ PTC was given a remission of income tax and wealth tax for three years. The authorised share capital was Rs 30 billion in three billion shares of Rs 10 each. The subscribed and paid up capital in the first instance was one billion shares.³⁷ The assumed dividend to be paid to GOP will be around 15%. T&T's net worth was to be transferred to PTC on the corporation's opening balance sheet, projected for July 1,1992. The net worth will comprise fixed and current assets, less liabilities and paid up shares by government, likely to be around 35% of capital, with 65% as debt capital. The PTC Board can comprise a chairman/chief executive, and upto eight directors. Hopefully, PTC can now adopt a longer term planning perspective, since T&T was unable to plan for more than a year because of uncertainty about the level of funding in the GOP's annual development plan.

Thus we can see that policy making was dominated by the government. Not only was the telecommunication structure owned virtually in its entirety by the state, it also operated as a government department. This has meant that the civil bureaucracy has dominated the policy making process. Another important participant in policy making has been the military, not only owing to the prolonged periods of military rule, but also because it is a major user of the telecommunications network. Till such time as the military develops a dedicated system of its own, and apparently such measures are now being undertaken, it will continue to have a major stake in the policy making process. The chief of army signals, for example, sits on major committees that influence policy, such as the committee on telecommunications that provides inputs into the five year plans. By contrast, private business has not enjoyed similar status. Forms of business representation, such as trade associations and chambers of commerce, have not overtly helped shape

policy. With more private sector involvement, this role can only grow in the future. The introduction of the mobile cellular system is an example, since it is clearly designed to serve business interests. The great majority of cellular telephone users are businessmen and executives, rather than government or military functionaries.

Despite the formal granting of autonomy, and perhaps because of its very recent occurrence, the PTC is still said to be very much under the control of GOP and the Ministry of Communications. For one, the external members of the board are none other than top-level state officials: the secretaries of the federal departments of communication, finance and economic affairs, and the chief of army signals. The current chairman is an engineer from within T&T's ranks, while the directors of finance and administration are civil servants. PTC will need major restructuring to become a profit-oriented and efficient commercial and business organization, with modern management practices. The transition might entail a significant turnover in personnel, or at least a major exercise in retraining.³⁸

PTC had hardly come into existence when it became the object of a strongly stated desire by the GOP to privatize the entire corporation. The newly-elected government of the Islamic Democratic Alliance, with Mr Nawaz Sharif as Prime Minister, had since early 1991 made an ideological commitment to a major privatization of public sector companies. Many of these organizations were nationalised during the 1970s, as with the cement, vegetable oil, automotive and engineering industries. Others had throughout been in the public sector, as with fertilizers. PTC, however, as a former government department, entailed the greatest shift across the spectrum to private ownership. A pre-bid moot was held in Islamabad in June 1991, which was attended by about 70 organizations, including several major international telecommunication companies.³⁹ The terms offered

were 51% equity to such buyers, with 49% to be offered to the public and PTC employees. The size of the purchase might require a combination of companies, or alternatively a divestment by services or regions to single companies.⁴⁰ PTC's privatization has still not occurred, and there has in fact been much uncertainty about the outcome.⁴¹

A number of interests are aligned against privatization. Some are philosophically opposed to such a transition, while others object to the rapid and almost peremptory manner in which it is being attempted. The PTC management is not in favour, as all levels clearly feel threatened that private ownership might entail career instability and displacement when a higher degree of productivity and capability is demanded. Corruption is rife in PTC, and there is said to be not a tender or a purchase unaccompanied by commissions and kickbacks. These perquisites are likely to be threatened under private ownership. A management buy-out has been attempted for some Pakistani public sector organizations; but the size of PTC makes this option seem remote. Labour unions are against privatization for much the same reasons. Unions have been an obstacle in the privatization program generally, as they have demanded either job security or adequate compensation. One of the reasons for low productivity is the extreme difficulty in firing personnel. Labour unions in PTC are constituted centrally, regionally, city-wise and service-wise, creating a network of labour combinations. Strikes have occurred periodically, the latest one was in late 1991. In this instance the workers succumbed to management's threat to invoke an essential services clause. Employment has burgeoned in PTC, as in other non-commercial organizations. Staff strength per 1,000 telephones stood at an abnormal 115 in 1978, and came down to 53 by 1991. Compare this with less than 10 in high income countries and under 30 in most middle income countries.⁴²

Certain external interests are also arraigned against rapid privatization. One is the

army, since it utilises the public telecommunication network extensively, and regards it to be of strategic importance. The civil bureaucracy, too, appears lukewarm, since privatization threatens to reduce its hold over economic operations and industrial production in the country. The World Bank, too, seems not to be in favour of the pace of change.⁴³ It has advised caution and realism, given that historically the privatization of British Telecom took almost 15 years, and that even with a learning curve*, this process in Argentina, Mexico and Malaysia took upto six years. Clearly the prospects of success can only be assured with carefully planned preparatory stages, providing guidelines for a proper regulatory and contractual environment, an analysis of both international and domestic capital markets, and a strategy towards addressing the interests affected, especially labour issues.⁴⁴ A clearly enunciated telecommunications policy now needs to be established, rather than contingency measures. As an example, bidders were told that the government would fix a reserve price for PTC. This appeared to be quite meaningless because of the lack of proper information on the value of PTC's assets. A consolidated statement of inventories has yet to be prepared. It is even alleged that PTC is grossly inflating its asset value, in order to dissuade foreign buyers. Moreover, PTC has not yet had an external audit; its income statement and balance sheet prepared for the year ending 30 June 1991 is quite rudimentary, and has not been prepared by a qualified firm of chartered accountants.⁴⁵ This lack of transparency remains a defensive tool for entrenched interests. Trying to achieve almost instant privatization under these conditions was, therefore, hardly realistic.

A Telecom Foundation has been set up recently, the proceeds of which will go towards the welfare of ex-employees of PTC. The foundation has since 1992 been engaged successfully in winning contracts for civil works in telecommunications projects, and specifically as part of the expansion under the BLT schemes. The

foundation has brought the expertise of its engineers to bear in winning contracts, and Siemens, Alcatel and Ericsson are utilising its services. The foundation at present does not plan to diversify into other businesses; on the lines of the largest such organization in the country, the Fauji Foundation, for ex-army personnel. Fauji has invested in food processing and fertilizers, and also runs schools and hospitals.

There are certain exceptions to the PTC monopoly. The Pakistan Railways, the Water and Power Development Authority (WAPDA), and Sui Northern Gas Pipelines Limited (SNGPL) have their own telecommunications networks. The military, apart from using the PTC system, also has its own facilities, as do the country's police forces. Owing to heavy usage and the vital role of communications for their operations, these organizations could not depend on the low penetration and quality deficiencies of the public network.

In the case of Pakistan Railways, financial constraints prevented early improvements from the rudimentary system inherited from colonial rule. Stop-gap arrangements included extension of track control circuits, opening of subcontrol offices, installation of teleprinters and of HF and VHF radio circuits. Overhead wire circuits were leased from T&T, but they were prone to breakages and the wires had deteriorated considerably with aging, with consequent unreliability of service. From 1979 work began on a more modern communication system along the Karachi-Peshawar main line and important branch lines. A 960 channel microwave system with 44 stations and a length of around 2700 kilometres was established. In addition, a 36 channel UHF system replaced the open wire lines, linking about 290 stations. A VHF radio system with 77 base stations gave access to locomotives and yards. Seventeen automatic telephone exchanges were also installed in the major stations.⁴⁶

SNGPL, a public sector company, had its gas fields in southern Pakistan, while its

market was up-country. For its work of purification, transmission and distribution of a potentially explosive substance, an in-house telecommunication network was developed, which extended throughout the gas transmission system. The government under its Mineral and Gas Safety Rules required a telecommunication system owing to the hazard factor. Had the T&T been more reliable, leased circuits might have sufficed. With the existing inadequacies, SNGPL had to incur the additional heavy costs of developing a dedicated system, which would be regarded as a diversion of resources from energy development. SNGPL, which also undertakes pipeline construction projects, completed the survey, fabrication and erection work itself, through its telecom wing. A UHF radio link established in the 1960s was replaced in the mid-1980s by a microwave link. Telemetry equipment was currently under installation, to provide monitoring capacity to detect changes in power generation variables. SNGPL had 51% government equity, and was currently one of the corporations listed for privatization.⁴⁷

WAPDA, responsible for the country's electrical power generation and distribution, was the other agency with its own telecommunication network. It began to establish this in 1958, with a project for power line communications (PLC) between its main grid stations. These centres were distant from the urban areas where the T&T system was concentrated. WAPDA's network spreads throughout the country, to provide real-time status of power supply from its thermal, hydel and steam systems. Equipment has been installed for speech relay, teleprotection, telemetry and teleoperation. The system is collectively known as supervising control and data acquisition (SCADA). WAPDA has a national control centre located in Islamabad, which has PLC and UHF communication with the main grid stations. Since 1982 a nation-wide microwave link, using Ericsson's Load Despatch System, has been installed, with current plans to upgrade it from 60 to 120 channels. A pilot project for

a fibre optic link is underway, though the expenditure involved makes implementation on a larger scale unlikely.⁴⁸

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1. Interview with Mr Kamal Abbasi, General Manager, Telecommunications Division, Siemens Pakistan Ltd., Islamabad, January 1992.
2. See S. Ansari, "Pakistan" (UNIDO, "Meeting on Technological Cooperation for the Development of the Telecommunications Industry in the Asia-Pacific Region", 1971), pp. 5.5-5.6 (henceforth Ansari).
3. Asian Development Bank (ADB), "Appraisal of the Third Telecommunications Project in the Islamic Republic of Pakistan", Report No. LAP: PAK 22273 (1990), p.5.
4. Ansari, pp. 5.1-5.4
5. Interviews with Mr Zia Mohiuddin and Mr Moaz Mohiuddin of PanAsian Marketing Services (Pakistan representatives of Ericsson), Islamabad and Lahore, September 1991.
6. See W.W. Ambrose, et al., Privatizing Telecommunications Systems (Washington, International Finance Corporation, 1990), p.35.
7. The World Bank has helped to fund five telecommunications projects in Pakistan, and has no further projects planned. The third ADB project is currently in progress. The appraisal reports for these projects provide useful reviews of telecommunications development in the country.
8. Interview with Brigadier Rathore, ex-Chairman, NRTC, Lahore, September 1991.
9. Ansari, pp. 5.7-5.8.
10. Ansari, Ch IV and Annex. III.
11. "Systems Limited (A)", Lahore Business School Case No. 08-168-87-1 (Lahore, 1987), pp 1-2.
12. As an example see "Fazalsons", Lahore Business School Case No. 14-077-87-1 (Lahore, 1987).
13. Interview with Mr Asif Mallam of Digital Communications, Lahore, August 1991; and Ansari, p. 5.9.
14. Interview with Mr Sohail Ahmed, Managing Director, MEI, Lahore, August 1991.
15. Ansari, p. 5.10.
16. ADB, "Appraisal of the Second Telecommunications Project in Pakistan", Report No. PAK: Ap-60 (1985), p.2.
17. Hafiz Investor Services. Report No. M8, (Karachi, 1990).

18. Interview with Ms P. Challeyer, Project Director, TAL, Islamabad, January 1992.
19. See Telecom Australia Publications (nd): "Telecom Australia (International) Ltd.", and "1990-1991: The Investments, The Returns".
20. PTC's training facilities consist of a staff college, give regional training school, and give district training centres. The staff college specialises in more advanced courses for engineers and supervisors. The regional schools serve technicians and telephone and telegraph operators. The district training centres conduct basic courses for linesmen and wiremen. The annual training capacity is only about 4% of the labour force, and only half of this is utilised. See World Bank, "Staff Appraisal Report. Pakistan T&T Department. Fifth Telecommunications Project", Report No. 5483-PAK (1986), p.18.
21. See W.W. Ambrose, Privatizing Telecommunications Systems, p.35.
22. Ansari, p. 2.3.
23. Interview with Mr C. Edwards, CEO, Paktel, Islamabad, September 1991.
24. See Cable and Wireless Annual Report. 1990. p. 26.
25. See "Millicom International Cellular: The success story behind Instaphone", Pakcom document (nd).
26. See "Arfeen at a glance", Arfeen International (Pvt) Ltd. document, Karachi (nd).
27. Interviews with Mr Javed Feroze, Director, Arfeen International; and Mr. Irfan Qureshi, Branch Manager, Pakcom: Islamabad, January 1992. See also 'Instaphone' Special Report, The News (Lahore), January 1,1992.
28. See letter by PMCL, The News. September 26,1991.
29. Interview with Mr Usman Babar, Marketing Manager, Paktel, Lahore, August 1991.
30. Interview with Mr Irfan Qureshi, Pakcom, January 1992.
31. Interview with Mr M. Akram, Chief Engineer (Planning), PTC, Islamabad, January 1992.
32. Interviews with Mr Ashfaq Chaudhry, General Manager, and Mr Ghazanfar Ali, Divisional Engineer, CTRL, Islamabad, September 1991.
33. For texts of these two Acts, see the legal series Pakistan *Cade* (1985 and 1933), GOP, Islamabad.
34. Business Recorder (Karachi), November 8,1991. For text of Bill, see Gazette of Pakistan, November 27,1991. pp. 479-91.
35. See text of Ordinance in Privatization (Islamabad, PTC, 1991), pp. 31-40.

36. Interview, M. Akram, PTC.
37. PTC Ordinance, in Privatization, p. 37.
38. The urgent need for major restructuring has been emphasized by donor agencies such as the World Bank and ADB: see S.A. Sathar, "Pakistan. Strategic Issues for the Eighth Plan Telecommunications".
39. See Privatization, p. 2. Among the companies attending were AT&T (USA), C&W (UK), Ericsson (Sweden), Italtel (Italy), Telecom Australia, Wandel and Golderman (Germany), and Sumitomo, Marubeni and C. Itoh (Japan)
40. An international consultant is to be appointed to formulate a strategy for PTC's privatization. For the conceptual arguments in favour of privatization see: W.W.Ambrose, Privatizing Telecommunications Systems: and G. Roth, The Private Provisions of Public Services in Developing Countries (New York, Oxford University Press, 1987), esp, Ch. 5.
41. The News. October 15,1991 and February 3,1992.
42. "Staff Strength Relative to Telephones" (nd), and "Principal Telecommunications Statistics" (1991): PTC documents.
43. Letter of M.H. Wiehen, Director, Country Department I, Europe Middle East and North Africa Region, to Secretary, Ministry of Communications, GOP, July 17,1991.
44. For a further projection of the World Bank's approach to privatization, see S.A. Sathar, Pakistan: Strategic Issues for the Eighth Plan Telecommunications, pp. 8-10.
45. See PTC Annual Report. 1991. T&T's accounts were audited by, firstly, the Auditor-General of Pakistan, whose audit focussed on cash and compliance with government rules and regulations. Secondly, the Director of Commercial Audits, under the Auditor-General, audited T&T s commercial accounts.
46. "Railway Telecommunications Systems", Pakistan Railways document, Lahore, n.d. Also interview with Mr Farooq Aslam, Pakistan Railways Telecommunications Division, Lahore, August 1991.
47. Interview with Mr Ahmed Ibrahim, ex-General Manager, Telecommunications, SNGPL, Lahore, October 1991.
48. Interviews with Mr Zafar Mahmud, Chief Engineer, and Mr M Ayub, Assistant Director, Telecommunications Wing, WAPDA, Lahore, October 1991.