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CHAOS OR ORDER:
DESIGNING TELECOMMUNICATIONS POLICY
FOR NATIONAL DEVELOPMENT

By

Zongqing Zhou

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ABSTRACT

CHAOS OR ORDER
DESIGNING TELECOMMUNICATIONS POLICY
FOR NATIONAL DEVELOPMENT

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Telecommunications has traditionally been viewed as the quintessential public utility. Social, political and military sensitivity combined with economies of scale have put the telecommunications sector in a highly-regulated or direct government controlled environment. Beginning from the 1970s, however, policymaking for telecommunications has shifted from this early paradigm to a more economic-oriented model, namely, competition and marketplace.

The policy change is the result of a telecommunications technological revolution and the increasing significance of the telecommunications sector in the overall national economic system.

The purpose of this paper is to develop a theoretical framework to account for this trend of restructuring. Comparisons are made between the United States and Japan in order to shed light on the developing countries in their effort to design a national telecommunications policy for national development.

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I. Introduction

Telecommunications has traditionally been viewed as the quintessential public utility. Social, political and military sensitivity combined with economies of scale have put the telecommunications sector in a highly-regulated or direct government controlled environment. Telecommunications was believed to be a natural monopoly, an essential public good that government should provide in a noncommercial mode. Social, political and cultural considerations have been the key variables in making the national telecommunications policy.

However, beginning from the 1970s, policymaking for telecommunications has seen a general trend in favor of economic considerations, namely, competition and marketplace, although the exact form of competition and marketplace varies from country to country.

This trend is reflected in the worldwide restructuring of the telecommunications sector, from the United States to Western Europe, from the developed countries to the developing countries, from the democratic world to the authoritarian nations. The restructuring is undertaken on a continuum of policy choices and under different names in accordance with the various contexts in which they are formed. In the United States, it took the form of deregulation and divestiture; in Japan and the United Kingdom, it was privatization; in Europe, liberalization and competitive challenges; in China as well as other developing countries, decentralization and/or privatization. In 1983 and 1985, the

U.S. Department of Commerce conducted two telecommunications policy studies in 27 countries, both developed and developing, predicting that the trend would be toward liberalization, as Figure 1 shows.

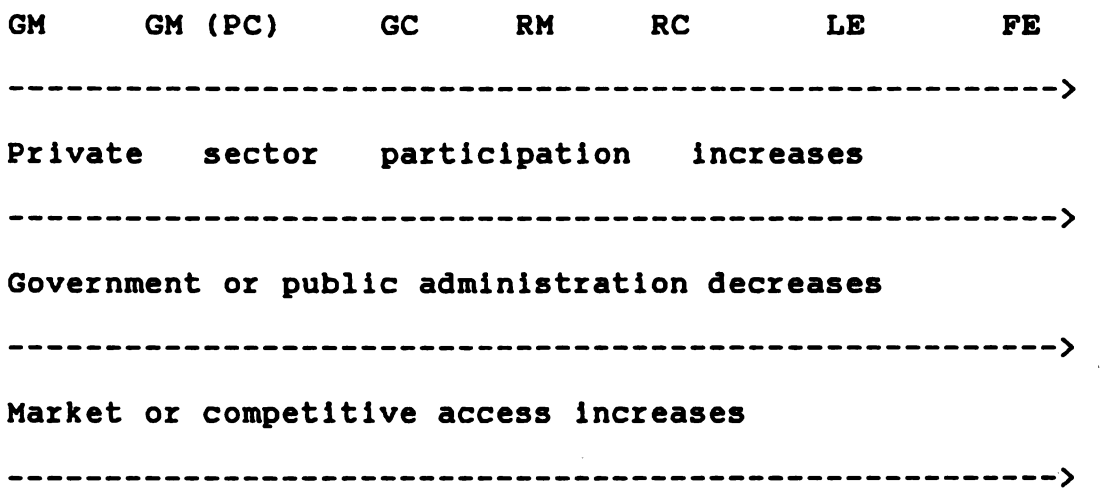


Figure 1: Continuum of Market Structure Models

Code:

GM = Government Monopoly (Government Ministry or Department)

GM (PC) = Government Monopoly (Public Corporation)

GC = Government Competition

RC = Regulated Competition

RM = Regulated Monopoly

LE = Liberalized Entry

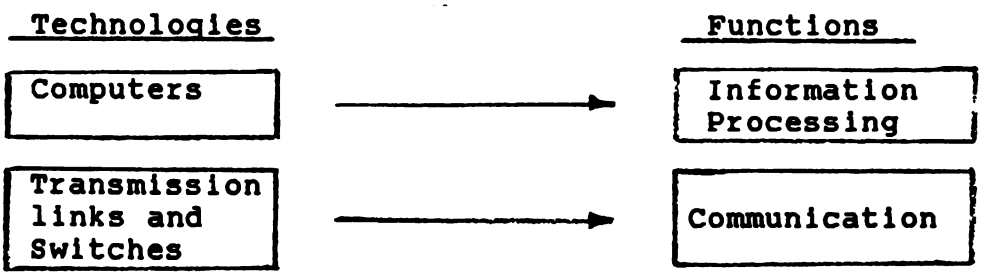
FE = Free Entry (Ideal Market Structure for Reference Only)

This liberalization, however, has been realized through different measures in different countries. In Japan, it was done by privatizing Nippon Telegraph and Telephone Public Corporation in April 1, 1985 (Mutoh, 1989). In China, beginning in 1984, the decision-making power has been decentralized from the Central Ministry of Posts and Telecommunications to the provincial telecommunications administrations (Telecommunications in Ten Countries, 1985). In Britain, by 1984, liberalization in the form of privatization and market competition was firmly established by the government (Jonscher, 1985). In West Germany, a 1987 "soft deregulation" led to the reorganization of the traditional postal services and telecommunications into two separate autonomous companies: 'yellowpost' and telecommunications. In addition, for all kinds of telecommunications services and user equipment private companies will be free to compete with the Deutsche Bundespost (DBP) (Esser, 1988). Similar liberalization actions are taking place in other Western European countries (see Western European Politics, Special Issue, 1988).

This raises the intriguing question of whether the changes are a bandwagon effect felt by respective governments in power or go deeper and reflect a more fundamental change. Indeed, this restructuring of the telecommunications sector is the result of the telecommunications technological revolution and the increasing significance of the telecommunications sector in the overall national economic system. The former has made available an abundance of application choices , ease of entry and network

options (see Figure 2) while the latter has created a dilemma for policy-makers in their effort to balance national political agenda with the increasing salience of the telecommunications sector in the national economic system.

Pre-1970: Separate technologies and functions



Post-1970: Three technologies (and industries) compete for enhanced communication functions

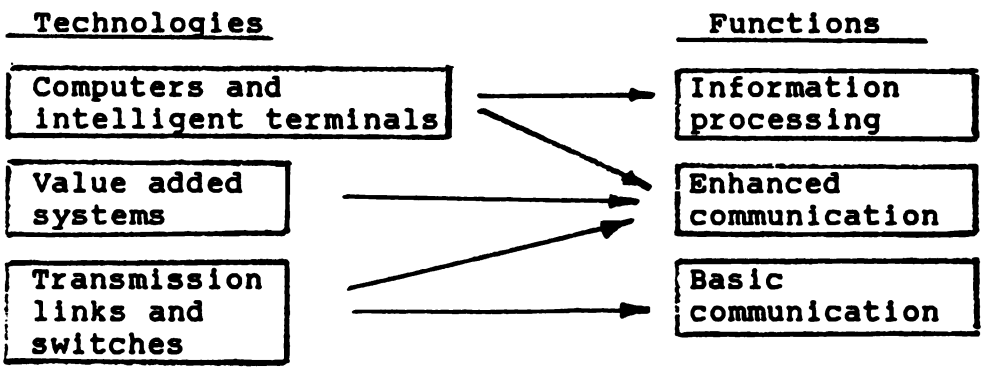


Figure 2: Telecommunication Revolution and the Abundance of Applications

Source: Adapted from Charles Jonscher, "Telecommunications Liberalization in the United Kingdom", 1985.

As Timothy Nulty and Eric Schneidewind (1989) point out:

> Governments thus face a complex dilemma: in order to respond to the growing technical and economic pressures, they must give their telecommunications entities greater autonomy and commercial orientation. But important national, social, political, and economic interests will be jeopardized by the move to more commercial modes of providing telecommunications services. (p. 30)

The salience of the telecommunications sector, which is the backbone of an information society, was brought out quantitatively by the American scholar Marc Porat in 1977. In his report to the Department of Commerce entitled "The Information Economy: Definition and Measurement," Porat showed that in the United States, by 1980 more people were engaged in information work than in any other kind of work. This shift of production activities conveys both economic and political implications. The economic implication is that the development of information technologies will determine the economic future of a nation, and as Dordick (1986) observes: "Somehow, being an information society has become a matter of national prestige" (p. 12).

This new context and dilemma call for reassessment of the policy choices if development and economic efficiency in the telecommunications sector are to be brought into full play. It is in this light that a cross-country comparison becomes meaningful and relevant, especially to the developing countries where the

pressures for change are further complicated by the special problems of developing economies.

The purpose of this paper is thus to develop a theoretical framework to account for the trend of restructuring the telecommunications sector by analyzing the internal factors and the external forces which contribute to the change. The internal factors refer to the technological characteristics of the telecommunications development such as networking and its organizational structure. The external forces refer to the social, political, economic and other societal environments in which the internal factors are shaped, constrained or boosted. Comparisons between Japan and the United States will be made to investigate the relevance of the approach. The implications resulting from the analysis and comparison will be applied to developing countries with particular reference to China.

II. Telecommunications and National Economic Development

The first hypothesis in the paper is that as the telecommunications industry becomes increasingly integrated into the national economic system, the policy-making will be more economy-and-market-driven than otherwise.

Since the 1950s, modernization specialists like Lerner (1958), Pool (1977), Hudson (1984) and Hornik (1988) popularized the rationale for the diffusion of communications technology as a correlate to economic development. However, these scholars were more interested in using communications technology for

facilitating social change, promoting education and political participation rather than viewing communications technology as a productivity tool and facility. In the meantime, scholars such as Fritz Machlup (1962), Daniel Bell (1973), and Marc Uri Porat (1977) pioneered the study and conceptualization of the "information society" under different terminologies. The basic proposition underlying these studies was that the United States had entered an age of the "knowledge" or "information" production economy which would "play critical roles in future economic growth" (Porat,1978,p.78). By 1980, about 48 percent of the U.S. work force were engaged in some kinds of information activities and as early as in 1967, already 25 percent of GNP was bound up with the information activities (ibid.). In Japan, a 1970 report by the Research Institute of Telecommunications and Economics (RITE) predicted that because of the differences in the rate of growth in johoka index that Japan would surpass U.K. before 1970 to become the second most "informationalized" society in the World (Ito, 1981). In this coming information society, the importance of the telecommunications sector is increasingly prominent, as the 1978 White Paper on Communications observed that in Japan,

> "the demand for information provided by mass media, which are one-way communication, has become stagnant and the demand for information provided by personal telecommunication media, which are characterized by two-way

communication, has drastically increased. This is the basic pattern in our country's johoka in recent years, and this trend can be seen in both business circles and private lives (ibid., p. 30).

This vision of the coming of an information society has an enormous impact on the political agenda-setting of each nation, especially on the developed countries. As early as 1969, the Organization for Economic Cooperation and Development emphasized the importance of information technologies and raised telecommunications as a "policy topic for Europe" (Kleinsteuber, 1986. p. 191). Rosa Fregoso (1988) reported that on January 18, 1984, Spain's economic future was officially linked with information technologies by the adoption of the Plan Electronico e Informatico. The Plan is said to be a blueprint for the "informatization" of Spanish industry (ibid.). In 1978, an official British paper notes that " It is the view of the United Kingdom that information processing and handling in all its aspects is now the critical technology for advanced industrial countries" (quoted by Schiller, 1981, p. 7). In Japan, Yujiro Hayashi used the term "johoka shakai (informational society)" for the first time in his book Johoka Shakai published in 1969 (Ito, 1981). The Research Institute of Telecommunications and Economics in Tokyo published a report in 1970, quantifying the degree of johoka and claiming that Japan had moved to third in the world after the United States and the United Kingdom on the

index of johoka (Ibid.). In a research report initiated by the Japanese government in 1969, it declared that "From now on, it can be said that information will play the crucial role in social and economic development" (quoted by Ito, 1981, p. 22). It also predicted that the Three Western Countries, France, U.K. and West Germany would become information society by the year 2000.

Don Lamberton (1986), in his article entitled "Australian Regulatory Policy" , demonstrates the close link between the increasing role of the information sector in the national economic system and the telecommunications policy-making in Australia. Australia, according to him, is ranked third in terms of information intensiveness only behind Canada and the United States. He shows that the share of information labor in the economically active population in Australia increased from 39.4% in 1971 to 41.5% in 1981. The United States had reached 41.1% as early as 1971, but the Canadian percentage was only slightly higher at 39.9% in 1971. The Australia information policy emerged as a composite of policies dealing with the role of government in assessing and responding to the increasing importance of the information sector in the national economic system (ibid.).

The impact, however, does not limit to the developed countries. The developing countries, in their effort to catch up with the Western developed countries, saw a new opportunity in the coming information society. Information technologies can be developed and utilized to quicken the pace of economic

development. In the Philippines, for example, the government gave assurances of economic growth opportunities to the business community through a rapidly expanded and integrated local, domestic long-distance and international communication structure that will be interconnected as part of the Global Telecommunications Network (G. Sussman, 1982). In the People's Republic of China, the "four modernizations" drive emphasized the urgent task of developing and updating the telecommunications sector at the recognition that "overall economic growth cannot be sustained unless the economy's supporting structures, including telecommunications, grow at an even greater rate" (Lerner, 1987, p. 33).

This information-based economy triggers the phenomenal growth of user demand for telecommunications. By its very nature, the demand for telecommunications requires that the telecommunications providers provide not only inexpensive but also fast, efficient services and options. Furthermore, unlike consumers of traditional industrial commodities, telecommunications users involve big government organizations, large companies and multinational corporations with enormous financial and political clout. Large multinational corporations based in the United States are prominently represented in organizations of users such as the International Telecommunications Users Group (INTUG) (Bruce, 1989). These entities make extensive use of telecommunications and demand products and services tailored to their special needs with regard

to price, efficiencies, and quality of service. This is especially the case in information-intensive industries such as transportation, travel, banking, and investment. These service industries reach customers through telecommunications networks linking heir offices, airline/hotel/car reservations, automatic teller machines, or computerized cash registers. Significantly, industrial companies are now entering these service-oriented areas: General Electric derives about one-third of its revenue, and Westinghouse about one-half, from service-based businesses (Geller, 1989). General Motors has committed billions of dollars to incorporating the telecommunications and computer networking expertise of Electronic Data Systems and Hughes Aircraft Company into its manufacturing and marketing structure (ibid.). One characteristic of the telecommunications users is that they are, in many cases, both users and providers. They will join their forces to put pressure on both the government and the telecommunications entities to restructure the telecommunications sector to meet their communications purposes.

Thus, the economic significance of telecommunications both as a productivity tool and facility in the overall national economic system, coupled with the increasing demand for fast, efficient and non-expensive services, has put enormous pressures on the government to reevaluate its policy in telecommunications sector, in this case, the restructuring of the telecommunications sector. The above discussion can be summarized in Figure 3.

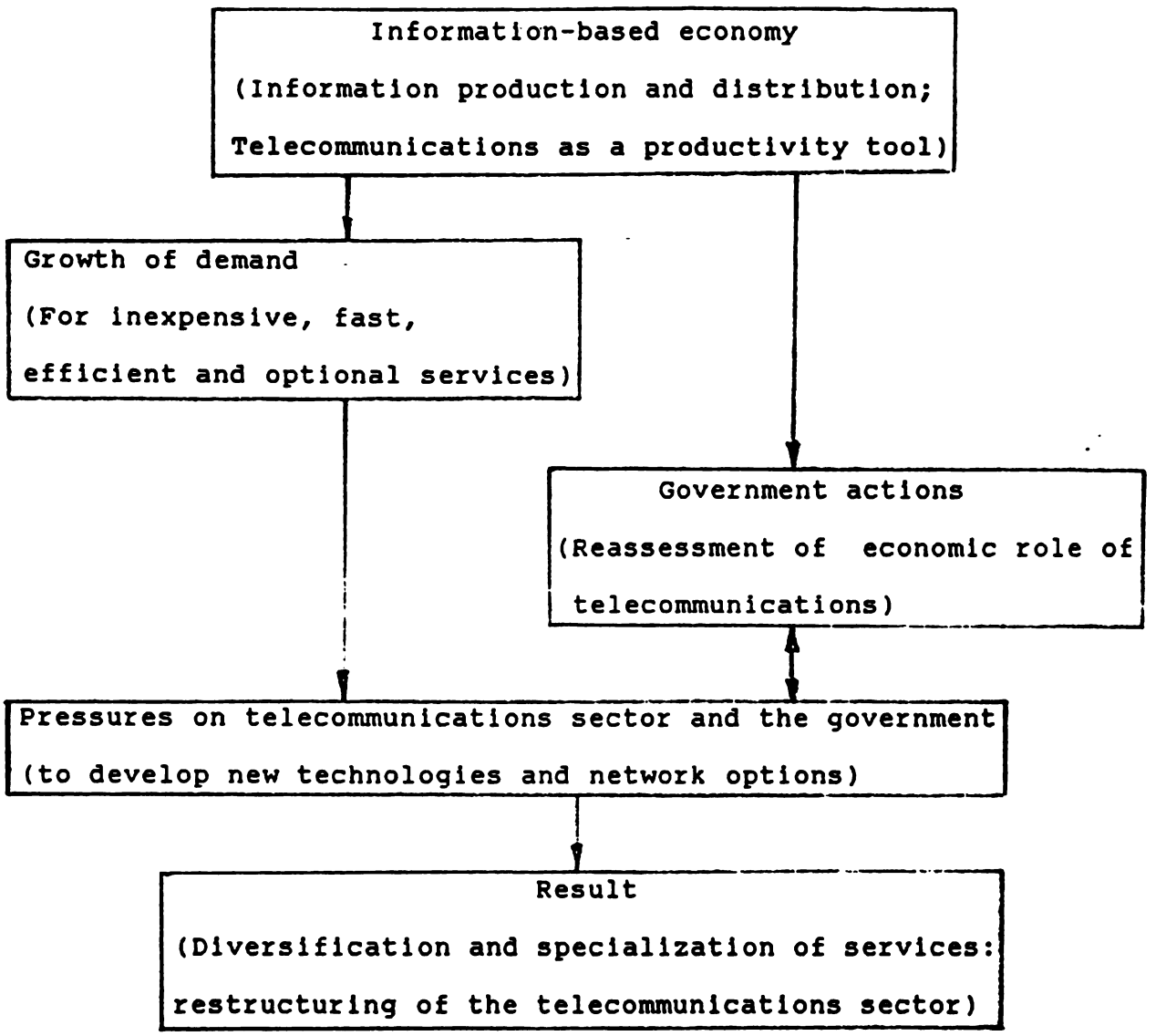


Figure 3: Economic Salience and the Restructuring of the Telecommunications Sector

To meet these pressures and promote the rapid development of the telecommunications sector, national policymakers find

themselves increasingly forced to resort to economic measures. These measures may include:

1. To give the telecommunications entities more power and freedom to plan and develop new technologies. Decentralization is often the result of this action. China is an example.
2. To privatize the national public telecommunications entities to pool private money and to introduce competition into the sector. The United Kingdom and Japan fall into this category.
3. To break the "natural monopoly' by allowing the entrance of different competitors, making the telecommunications sector a marketplace. The United States fits into this category.
4. To allow private telecommunications entities to exist alongside the public telecommunications entity to create incentives for competition. West Germany can be taken as a good example.

III. Characterizing Telecommunications Technological Development

The significance of the economic role of telecommunications in the national economic system was not fully realized until the technology revolution was triggered by the convergence of telecommunications and information technologies. The entry of computer intelligence into the network and terminals since the late 1970s (Ungerer, 1987) has led to a fundamental change in

communications. Semiconductors and satellites together make possible this revolution. At the same time, they have created a new architecture for communications, an architecture made possible by innovative devices that provide entree to the network architecture, or terminals. The implications of this convergence are twofold: the creation of a network marketplace and the explosion of services (Ungerer, 1987).

In many ways, the development of network technology is the history of the advancement of the switching technology. Early in the history of telephone exchange, the growth of the telephone system had been hindered by the switchboard problem (Mueller, 1989). This is due to the fact that, as the number of the subscribers to a telephone system increases, the number of possible connections among them grows much faster---roughly as the square of the number of subscribers (Ibid.). Consequently, switchboards became increasingly expensive to construct, and the operations needed to make connections became increasingly complex and slow as more people joined the exchange.

This challenged both the traffic engineering scientists as to the capacity of the switchboard and the managers for dealing with the increasing complexity of organizational operations (Ibid). The development of automatic switching technology and ultimately the digitalization of the switching process solved the first dilemma and has given rise to the proliferation of various kinds of services and application opportunities. Table 1 summarizes the service explosion of telecommunications.

Table 1: The 'Three Generations' of Telecommunications Services

Traditional services (first generation)	New services (second generation)	Advanced services (third generation)
Current basic telecommunications infrastructure	Enhancement of basic telecommunications infrastructure	New telecommunications infrastructure
Telephony Telex, teletex Low-speed data Mobile telephony Low-speed Facsimile	Integrated basic services with some speed enhancement (ISDN) Digitized voice Textfax Audiographic Teleconferencing Electronic mail Wider availability of mobile telephony Higher resolution videotex	Videotelephony Video-conferencing Bulk document transfer High-speed color facsimile High-speed data On-line graphic design Remote printing and publishing Dynamic computer load-sharing
Over-the-air radio Over-the-air and cable TV	Multichannel cable TV Direct broadcasting by satellite (DBS)	High definition television (HDTV)

Source : Adapted from Herbert Ungerer, Telecommunications in Europe , 1987, p. 38.

Thus, the solution to the switching problem has created both new opportunities of entry and organizational complexity, which become two key variables in facilitating policy changes in the telecommunications sector.

The scenario of the network marketplace is made even more complex by the full introduction of new broadband transmission technologies, namely, microwave, fibre optics and satellites. These new means of transmission of information open up a whole range of network alternatives to the traditional public wire network. MCI, for instance, is a microwave network operator and US Sprint boasts of being a fibre optics network. It was reported that there were over 400 companies in U.S. offering long distance telephone service (Harris, 1985). In the same light, without satellites, the boundaries of telecommunications might not have spread so widely. The satellite has freed us from the constraints of distance and has made communications networks simpler and , consequently, cheaper.

The emergence of intelligent terminals which have also been made possible by the same semiconductor chip, largely expands the power of the networks. A terminal is any device capable of sending and/or receiving information over a communications channel (Dordick, 1986). Intelligent terminals are those that can perform a variety of functions, including the storing and organizing of information for transmission on the network. This is important because, for some of the more specialized communications functions such as private lines that interconnect geographically dispersed offices of large firms or systems likely to be used for data and video, intelligence is often required and designed into terminals to ensure that network protocols are followed.

Together, the network marketplace, satellites and intelligent terminals have transformed the telecommunications infrastructure. Large distributed networks of computers, software, terminals, and databases have thus been created and provided the ideal productivity facilities. New services can be manufactured by providing added value to existing services, which in turn means easy entry into the telecommunications sector. Suppliers can specialize in processes and products in which they have a competitive edge, and there is even room for the small producer or cottage industry to custom tailor services to an individual user's specifications.

Telecommunications has not only become the cornerstone of the information society, but also a productivity tool and facility in the national economic system as well as in the world economy (Tehranian, 1988). The potential profitability coupled with the relative ease of entry into the sector, especially in the enhanced telecommunications services, began to draw resources from both inside and outside of the sector to challenge the monopolistic control of the sector. New entrants and vendors from various economic background constitute a strong pressure for sharing the opportunity. As Geller (1989) points out:

> Some, using microwave initially, wanted to compete in the area of toll services. Others wanted to interconnect new products to the telephone network for their value-added services... Some entrants were small, but many were large

companies (for example, International Business Machines, or IBM). They formed a powerful coalition for change... (p. 79).

The above analysis can be summarized in Figure 4.

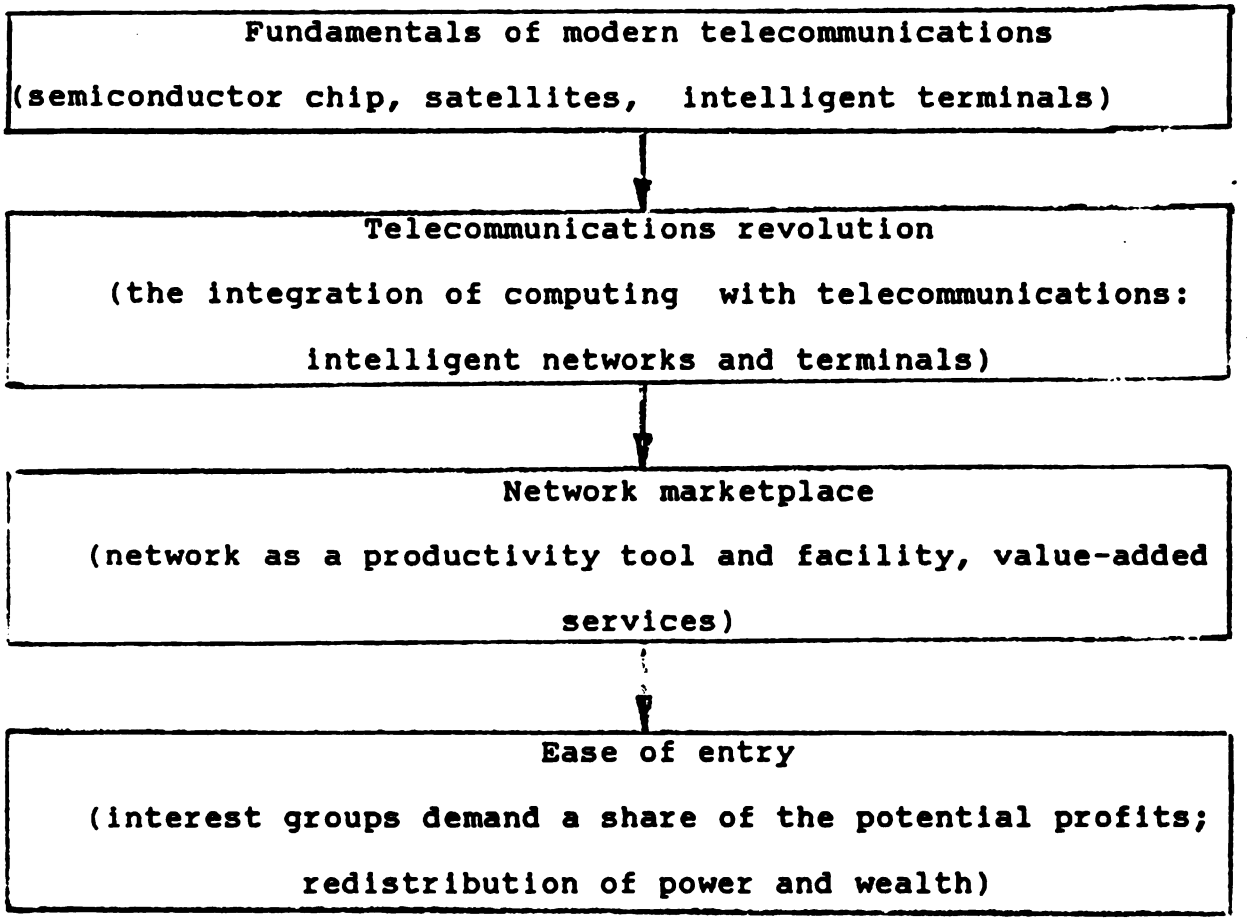


Figure 4: Technology Advancement and the Restructuring of the Telecommunications Sector

Together, the economic salience of the telecommunications sector in the national economic system and the revolution of the

telecommunications technology create enormous pressures for the restructuring of the telecommunications sector, which is more economic-and-market-oriented than otherwise.

Figure 5 further summarizes the analysis in the above two sections.

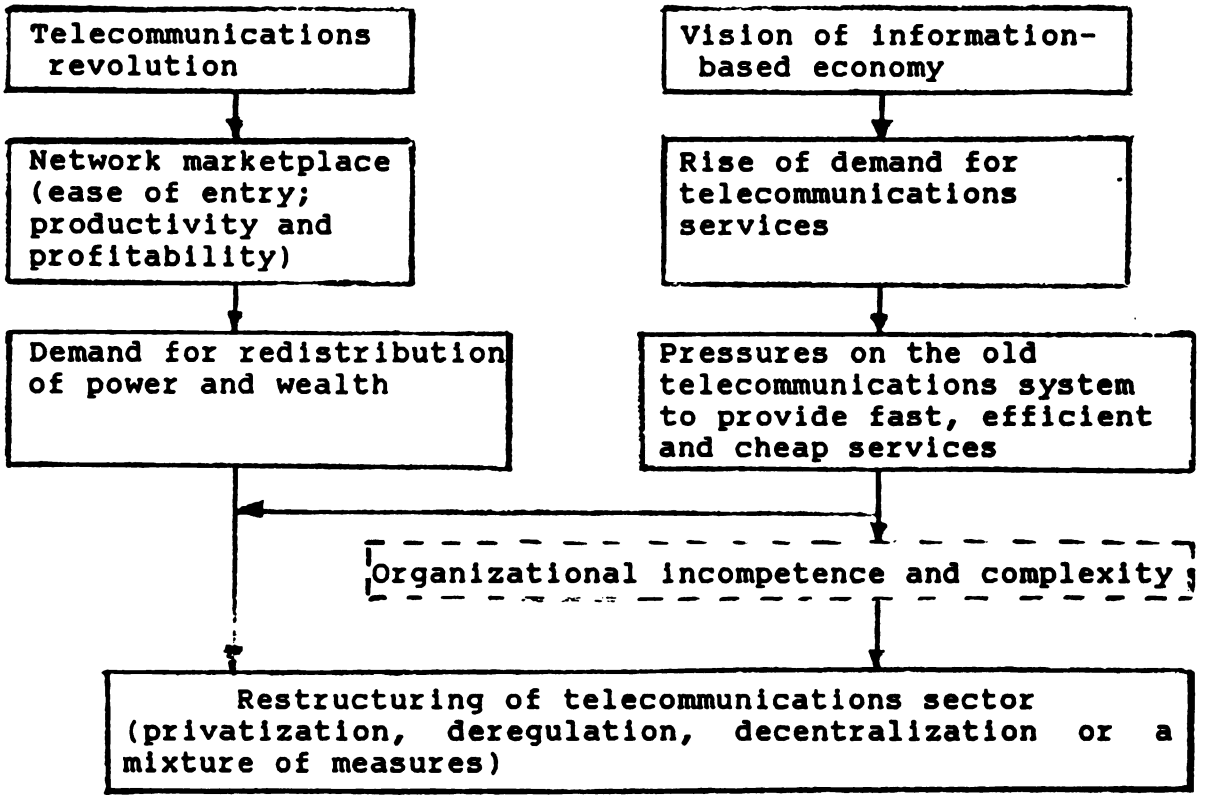


Figure 5: Major Driving Forces of the Restructuring of the Telecommunications Sector

IV. Theoretical Foundation

There are currently several theories to account for the making of national telecommunications policy. One theory draws from the statist theory of political science. The statist theory focuses on the state as a decision-making entity to pursue its own objectives by allocating power within the society. Some of the most important objectives are national wealth, distributional equity and the objectives related to power, security and stability (Katzenstein, 1977). Applying this theory to telecommunications policy analysis, the statist theory sees a close relationship between the telecommunications sector and the purpose of the state. Policy will be made in favor of those social groups and telecommunications developments that are viewed as essential to the maintenance of state power, national wealth and internal stability. Telecommunications is an important sector to the state in maintaining social cohesion, national security, and the economic system. The state will promote the development of the industry as long as it meets the purpose of the state (Noll,1985).

A more direct approach to the relationships between state theory and telecommunications policy was done by Vincent Mosco (1988). In the capitalist societies, according to him, forms of governance depend on the ways or modes with which an individual state processes its social claims or demands. The relationships among these forms and modes are reproduced in Figure 6.

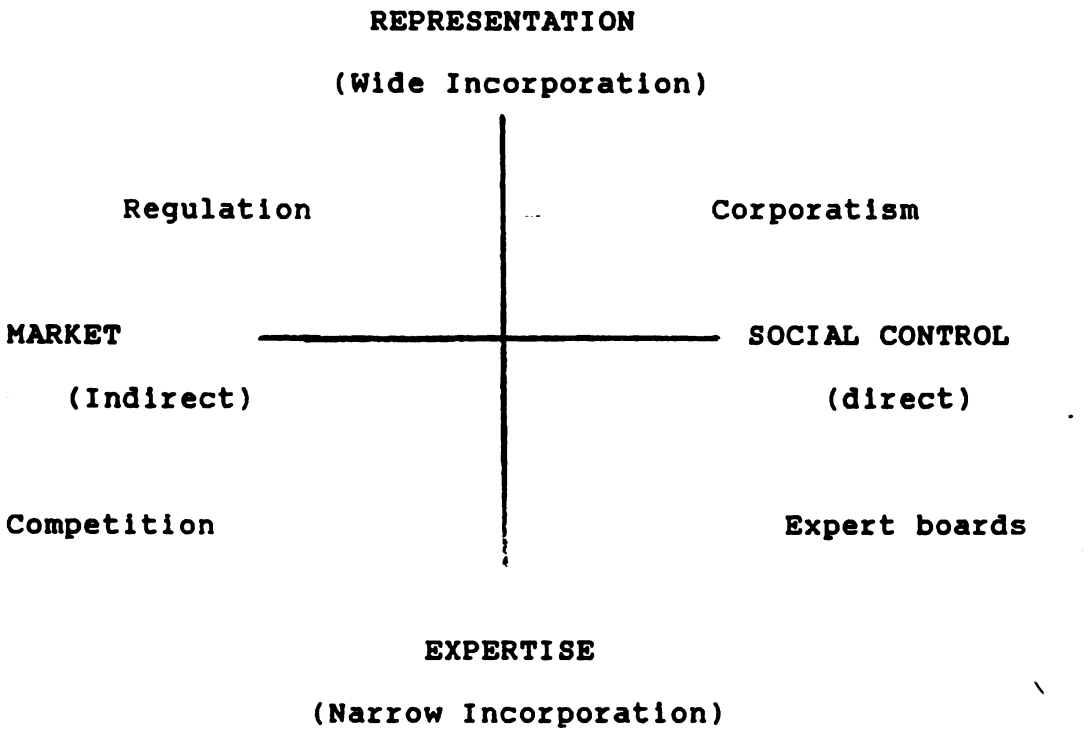


Figure 6: Forms of Governance For Processing Social Claims In Developed Capitalist Societies

Representation is a mode of settling social claims that incorporates a wide range of social representations. The market is a social system that is subject to monetary calculation for dealing with social claims. Expertise, in Mosco's words, "has the value of drawing on socially sanctioned views of what constitutes correct information, knowledge, and truth" (p. 109). This mode of resolving social claims relies on the select few, highly trained individuals who can claim expert status to reduce

the social claims. Finally, social control seeks social consensus over the cultural values and norms that govern daily lives of the people.

These four modes combine to provide four fundamental forms of governance in developed capital societies: regulation, private competition, expert boards, and corporatism. In this view, the state is still a separate entity which functions as an intermediator for settling different social claims. Three perspectives are identified as to how telecommunications policy was made based on this axial principle. They are pluralist, managerial and class perspectives.

The pluralist analysis of the restructuring of the telecommunications sector points to the shift in political values from the public interest to the competing private interests of different social groups. Competition and market structure are used to meet these diverse interests and social claims. The United States has been cited as a typical example. It is said that there is no planning process nor a centralized forum for decisions: the strongest and most persuasive voice prevails (Branscomb, 1983). The policy-making process is thus a game for those who learn the rules (Telephony, February 10, 1986. p. 68).

The managerial perspective, on the other hand, emphasize the need of the state to manage the growing complexity brought about by technological change and the division of labor (Mosco, 1988). As has been discussed in the previous section, the blurring of

the computer technology and telecommunications and the proliferation of services resulting from this convergence are responsible for this complexity. The inability on the part of the state organizations to deal with this rapid and complex changing arena leads to the reliance on the market or competitive forces to settle these new social demands, while at the same time trying to retain as much as possible their administrative power (Ito, 1985). This inability is reflected in several ways. First, claims from different social groups are too strong that any decision on the part of the governance may be considered biased and thus triggers possible social instability. Second, the government finds it increasingly hard to allocate financial resources to different social claims because of the limitation of available money. Third, the government is eager to shift the social responsibility to other social groups to avoid direct conflict with the people it governs.

The class perspective sees the state as an entity supporting the capital accumulation and expansion. Its basic assumption is that there are inherent conflicts of class interests in the social system. One of the major functions of the state is to regulate conflicts between capital and labor, and ensure that the national capital grows in the world market. In the light of this view, the restructuring of the telecommunications sector is a fundamental attempt by the state to readjust the conflicts and redistribute the capital among the social classes. The divestiture of AT&T resulted in eliminating thousands of jobs and

released AT&T from its responsibility for various social obligations, which in turn paved the way for capital accumulation and expansion in the world market (Mosco, 1988). As David Heald (1988) also points out that in privatizing British Telecom, the British government seeks to "weaken trade unions by avoiding the obligation placed upon public bodies" (p. 31).

These perspectives are self-contained and can claim to shed light on the process of telecommunications policy making. It is thus not appropriate to say that one perspective is better than another. Indeed, varied as they are under different terminologies and with different foci, they share two basic assumptions. One is that technology advancement leads to a multitude of services (or complexity of organization) and ease of entry which in turn invite various social groups to claim a share of the resources. The restructuring of the telecommunications sector is an attempt on the state side to settle these new conflicts or claims. The second is that telecommunications has achieved such an economic significance in the national economic system or capital accumulation and expansion that other social values are sacrificed or compromised in favor of economic measures to ensure that the sector is developed and promoted. Figure 7 shows the axial relationship between these two factors and degree of restructuring the telecommunications sector.

This figure shows that the degree and speed of the restructuring of the telecommunications sector is contingent on the degree of economic salience and the status of technological

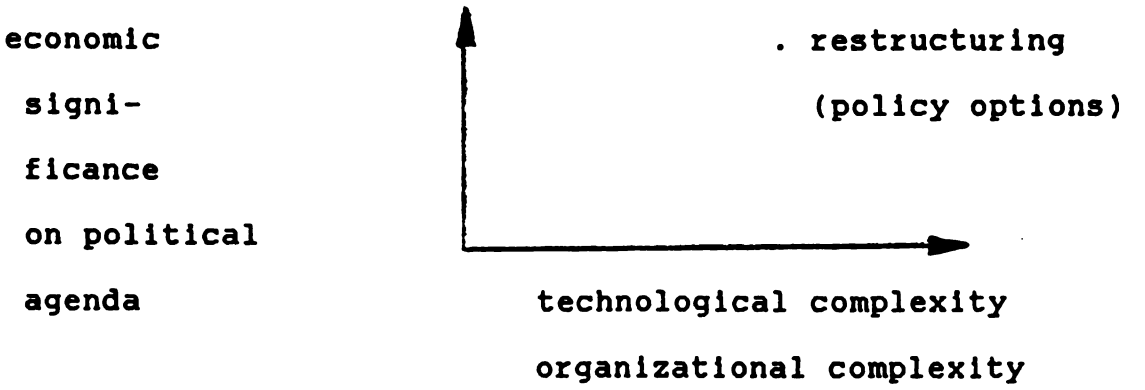


Figure 7: Relationship Between Restructuring and Major Driving Forces

advandcement in individual countries. The more significant the telecommunications sector in the economic system and the more advanced the technology, the more rapid the speed of the restructuring of the sector should be. In this light, the United States, Japan as well as other developed countries should be in the forefront of the restructuring.

This axial relationship can be further combined to produce various models of policy orientations. If the economic salience of the telecommunications sector is high on the national political agenda and the technology is abundant with increasing organizational complexity, a competition or market-oriented model is most likely to occur. The United States, Japan and other advanced countries at present would be best classified in this category. If the economic salience of the telecommunications sector is high on the national political agenda, but the technology resources are limited and the organization is

relatively simple, a monopoly or centralized model would be most likely to result. Most developing countries with a sense of "catching-up" and in their early stages of telecommunications development would fit into this category. If the economic salience of telecommunications sector slips on the political agenda (as when the sector is fully integrated into the national economic system and stabilized), but the technology keeps changing, a relatively free competition can be expected. In real life, however, there is no perfect model. Models vary according to the relative position these two factors are located on the two axes. Furthermore, there is a limit as to how far these two axes can go. In the competition model, once the issue of telecommunications significance is settled, technology change becomes an important determinant. If the technology keeps changing at a pace that permits resources to continue to be abundant, competition will serve both the government and the competitors. If, on the other hand, when competition outpaces the advancement of the technology, merger will result and government intervention, e.g. regulation, will be called for, more often than not, by the competitors themselves. As Myers (1985) points out, in the United States, the fierce competition brought about by deregulations and divestiture of AT&T has resulted in a lot of mergers.

Noll (1985), who uses an eclectic approach to synthesize various theories, comes to the following conclusions which are important and relevant to the above analysis:

1. The speed of the restructuring of the telecommunications sector should be greater in nations with relatively advanced sectors that make extensive use of the telecommunications system.
2. The speed of the restructuring of the telecommunications sector should be more rapid in countries in which the performance of the industry is least efficient, thereby imposing the greatest cost to users.
3. The speed of the restructuring of the telecommunications sector should occur more rapidly in countries in which reorganization to improve the performance of the domestic economy is, in some form, a salient political issue.

In summary, there are two hypotheses discussed so far. One is that the increasing economic salience of the telecommunications sector in the national economic system leads to the reconsideration of the traditional role of the sector and as a result policy-making is more and more driven by economic and market factors rather than cultural and social values. The second is that the telecommunications technological revolution makes the resources abundant and profitable, which triggers enormous social claims both in the quality and quantity of the telecommunications services and in the business demand for a share of the profit. These two hypotheses are generally supported by communications scientists in analyzing the changing scenarios of telecommunications policy in each individual country

(Slade and Barchak, 1989; Ito, 1986; Heald, 1988; Charles Jonscher, 1986; Fregoso, 1988; Geller, 1989) and in searching for major driving forces behind the scene of the worldwide restructuring of telecommunications sector (Bruce, 1989; Nulty, 1989).

V. The Experience in the United States: From "Paradox" to Plenty

In the United States, regulatory policy in telecommunications has paralleled assessment of the role of telecommunications in the overall social system. Telecommunications, both broadcasting and telephone industries, have been historically heavily regulated on the theory of public interest and universal access. The concept of public interest and universal access touches on both social and political sensitivity and economic domain. This means that different interpretations of these two concepts would result in different economic consequences. As Victor E. Ferrall convincingly demonstrates that, even though broadcasting has been deregulated more because of (or in the name of) its social impact than its economic feasibility and performance, each change or deletion of the rules resulted in altering economic relations among segments of the television industry and its users (Ferrall, 1989). For example, radio and television programming have been directly and indirectly regulated by the FCC to require the licensees to render the best practicable service to the community they reached (ibid.). The lifting of program requirements by the Fowler

commission has had the indirect but significant economic effect of increasing the amount of commercial time available for sale. This lifting has been done, it was argued, in the interest of the public, as Chairman Fowler put it: "If we let the industries operate with fidelity to the markets they want to serve, the public is better off" (quoted by Ferrall, Jr., 1989, p. 19)
In a sense, the battle between regulation and deregulation was the result of different interpretations of these two concepts: in what way can these two goals be fulfilled, competition or monopoly?

This generalization, of course, is too simplistic. In broadcasting, the deregulation initiatives beginning from 1981 by the Fowler Commission encouraged, facilitated, and accelerated new entry into broadcasting markets, particularly by individuals with little or no prior experience. " Fowler", Ferrall observes, "was passionately supported in his deregulatory crusade by station operators, particularly small radio station operators who saw an opportunity to escape the oppressive FCC yoke" (p.16).

The pressure for deregulation did not, by any means, come from only the traditional broadcasting industry. New means of delivering broadcasting signals became available as early as the 1940s when cable TV was introduced simply as a way to improve television reception. Now, television signals can be carried through cable, microwave, satellite or a mixture of them. These new ways of delivery lead to services like subscription television (STV), MMDS ("Wireless cable"), direct satellite

broadcasting (DBS), and cable TV. Some of these services have been in the market for quite a while, and did not seem to constitute an economic threat to the traditional television industry separately. However, cable has seen a steady growth since its appearance in the 1940s and took a leap in 1975 when Home Box Office revolutionized the cable industry by beaming television signals through the RCA-launched satellite (Singleton, 1983). Beginning from 1981, cable had become a direct competitor of the three national television networks in the sale of national advertising time and of local stations in the sale of local advertising time. In 1988, it is estimated that the sale of advertising time of cable and systems reached $1.45 billion, nearly six percent of projected television advertising sales (Ferrall, 1989).

This creates an interesting phenomenon. Within the industry itself, pressure for deregulation comes largely from "outsiders" who saw broadcasting as a profitable business and wished to enter, and from small station operators who considered themselves bound and disadvantaged by the old regulations. On the other hand, because of the competition from outside the traditional television industry that has been made possible by the new technologies, the traditional television industry as a whole felt that they would be competing on an unfair ground if they were regulated while the competitors such as cable were not. The pressures for change were thus both from the television industry itself and from the outside competition.

The electronic services, including telegraph and telephone, began in an unfettered marketplace and only through market competition did the monopoly service of Western Union become established in telegraphy as AT&T became dominant in telephony (Branscomb, 1983). Interestingly enough, it was monopolization that led to both state and federal regulation.

The telephone industry in the United States was governed by Title II of the Communication Act of 1934. The underlying philosophy of the 1934 Act was to make available as far as possible to all the people in the United States, rapid, efficient, nationwide, and worldwide wire and radio communications for the defense and safety of life and property. According to the FCC:

> The necessary attributes of a so-called natural monopoly which ordinarily attends efficient and economical telephone service... and the public interest in the...development of...effective and economical communication facilities are...factors which disclose the underlying character of this business as an essential public utility (quoted by Weinhaus and Oettinger,1988, p.11).

The social and political overtone was obvious in these goals. This was largely to be expected. Telecommunications was, and indeed, has been, and will be an important means of social control and organization. During World War I, the federal

government nationalized the telephone industry apparently because of its importance for the national defense and security (Branscomb, 1983). In fact, in order to mobilize the total wireless resources of the country for war, the Navy took over all U.S. wireless stations (Head and Sterling, 1987).

In addition, telephone exchange can be said to represent radical rearrangement of social space and relationships. It is not only a science of technology but also a science of social organization. It has been claimed that AT&T probably has more daily dealings with United States citizens than the United States government itself (Brooks, 1975).

It was in this environment that AT&T was able to maintain its monopoly status with government consent since 1913. Competition, the main tenet of the American economic system, was believed not to fit the case of telecommunications because it would result in confusion and waste (see Brooks, 1975). It would be a confusion because the goal of universal access would be threatened. It was the government's goal to let every American home have access to the telephone service and keep the rate at an affordable level for every American home. The telephone rate, local and long-distance, rose less than 20 percent between 1960 and 1974, while the consumer price index of all goods and services was rising almost 70 percent (ibid.). The cross-subsidy practice of long-distance services was enforced by policy in 1943 to avoid cream-skimming (the practice of concentrating resources on profitable sectors of the market) of telephone

services. The divestiture of AT&T ended the cross-subsidy practice, which was at the expense of the socially disadvantaged and a victory of the larger users. Furthermore, competition means giving more decision-making power to the competing entities and losing some of the political control of the entities. It would be a waste because the resources were still limited and did not allow more than one telephone entity to operate in a competition mode. In fact, competition in the telephone industry existed as early as 1878, two years after Alexander Graham Bell obtained his first telephone patent. By the early 1900s there already were 3200 Bell exchanges and 6600 independent exchanges (Weinhaus and Oettinger, 1988). Competition was fierce. This competition, according to John Brooks (1975), resulted in "wasteful duplication" and "public inconvenience" (p. 108) because two or three telephone systems would operate simultaneously in a single town or city (ibid.).

In a word, telecommunications was so important to the national security, stability, and economic feasibility (economies of scale and scope) that the United States produced what John Brooks (1975) called the AT&T "paradox" : a monopoly in a competitive economy. This paradox was said to be due to the "particular nature " of telephone services (Sobel,1982; Brooks, 1975; Nulty, 1989). What was the particular nature of the telephone industry ? It was particular because of its social impact (Pool, 1977; Marvin, 1988). These social effects encompass every facet of human behavior and are complicated by being in

diametrically opposite directions. For example, with the telephone came relatively sudden and largely unanticipated possibilities of mixing heterogeneous social worlds. The phone also permits outsiders to cross boundaries of race, gender, and class without penalty (Marvin, 1988). The phone invades our privacy with its ring, but it protects our privacy by allowing us to transact affairs from the fastness of our home (Pool, 1977). The telephone contributed considerably to urban sprawl and the mass migration to suburbia. It also helped create the congested downtowns from which people are now fleeing (ibid.).

It is particular because of the enormous investment in building a national public network and therefore the importance of economies of scale and scope; because of its strategic significance in national security and capitalist expansion in the world market (Schiller, 1981). In the word of AT&T Chairman H.I. Romnes in 1971, AT&T has

> ...responsibility to the nation at large: first, to take scrupulous account of the consequences of what we do on the general economy; second, to respond to the nation's needs whenever and wherever our skills are truly needed; and third, to give our wholehearted support to the great goals our country has set of itself : a growing economy, a decent order in our society, the freedom and scope for every individual to fulfil his personal capacities. and an environment that will sustain the continuing enhancement of

the quality of our national life (quoted by Schlesinger et al., 1987, p. 13).

By the 1970s, however, these original goals and social obligations began to face challenge and erosion. New technologies of transmission, increasing sophistication of customer premises equipment, dramatic growth in the volume of business, and availability of competitive services and products outside the Bell System and the increasing international competition all challenged the monopolistic status of AT&T and the belief that telecommunications is a natural monopoly.

In customer premises equipment, the distinction between the previously separate functions of data transmission and data processing, i.e., between telephones and computers, was blurring. What was essentially a digital computer sat at either end of a telephone call. A so-called smart telephone sold now uses the digital technologies for both information transmission and information processing.

In the local exchange, PBXs and advanced switching systems removed switching from the central office to customer premises and began eroding business boundaries between customer premises equipment and the local exchange. The growing demand for distributed data processing and data communications has fueled competitions for vendors of telecommunications systems. The third generations PBXs are capable of switching large amounts of simultaneous voice/data transmission and the fourth generation

PBXs can support internal image and video transmission. The trend toward shared databases and distributed processing has positioned the PBX the center of telecommunications. There are about 240,000 PBXs installed in the United States today, and the market has been growing at a rate of about 15 percent compounded each year ($3.4 billion in 1985) (Geller, 1989). Additionally the local network's natural monopoly was challenged as citizens band (CB) radio and pocket page services were able to bypass the local loop, thus invalidating natural monopoly justifications.

In the long-distance exchange, AT&T's monopoly was challenged by other carriers' long-distance microwave radio transmission and fiber optics networks.

The new technologies combined with the rising consumer demand attracted the attention of the entrepreneurs in other industries. Some of the largest U.S. corporations--IBM, Xerox, Exxon, RCA, and others--which traditionally served different markets from AT&T's, began to encroach on the company's territory. The financial stakes were enormous; by the mid-1970s industry revenues were pushing $40 billion domestically, and some forecasts predicted annual revenues of $250 billion by 1985. The market for hardware was also growing rapidly. In 1973 total expenditures for electronic equipment in the industry exceeded $12 billion and were growing at about 9 percent per annum (Schlesinger et al., 1987). Technological and market pressures had combined to change the government's historic belief that telecommunications was a natural monopoly.

At the same time, the abundance of the resources posed organizational and managerial problem. This can be understood from two aspects. On one hand, the increased sophistication and complexity of the network and diversification and specialization of the equipment and services demanded correspondingly increased levels of technical expertise and administration. These problems meant the cost and efficiency of running the telecommunications business by a monopoly were put into serious question. First of all, as Mueller (1989) pointed out in his article on the early telephone switching problem, telephone exchanges could become more expensive to run (per subscriber) as the number of subscribers rose. In modern telecommunications, telephones, computer terminals and other forms of electronic equipment may well continue to fall in cost. But the fusion of voice, data, and video communications brought about by the convergence of the technologies will pose both organizational and managerial problems, and thus will not likely follow the same pattern.

Second, this organizational and managerial problem directly threatens the efficiency of the monopolistic performance and as a result endangers the fulfillment of the social pledges. For example, social discontent would arise if the monopoly did not meet the public expectation of low prices and good services. As Mueller (1989) writes, "The linkage of growth with rate increases strongly affected the political climate in which telephone companies operated. Politicians and the public who had

difficulty understanding why growth did not bring lower cost came to embrace competition, municipal rate regulation or both" (p. 558). One of the reasons that the nationalization of the U.S. telephone and telegraph mentioned above did not live long was that the government was unable to meet its promise of keeping a low rate. The public outcry was so great that less than a year later Congress proposed the immediate return of telegraph and telephone services to their private owners (Branscomb, 1983).

The American experience, from the "paradox" to the current plenty, is thus an outcome of the balance among the technological, political, social and economic forces.

VI. Japan: From "consensus" to "consensus"

In Japan, the telephone industry began as a government monopoly. The reasons for this monopoly, according to Ito(1986) were three:

1. Preservation of communications secrecy by military, police, and other government agencies was deemed important.
2. Under private management, investment would be made only in urban areas, and diffusion to rural areas would be delayed.
3. Telephones in most foreign countries (except the United States) were operated under a government monopoly.

These reasons show that social and political priorities were the salient features in making telecommunications policy at the time. Like in the U.S., public interest and universal access (reason 2.) were chief goals. Unlike the U.S., however, which was born

with a democratic government and embraced the religion of competition, Japan has had a long tradition of emperors and government ownership. Viewed in this way, government control of the telecommunications sector was more to be expected than in the U.S. Additionally, compared with the U.S., Japan is a small country which has every reason to be very sensitive to national sovereignty, security, and social stability and harmony (reason 1.).

These social objectives were reflected as early as 1898 when Japan began research on wireless communication. It happened during the Meiji Era when Japan was moving ambitiously to construct a modern state. There was a national consensus for achieving the goal outlined by the popular slogan, "A prosperous nation with a strong defense" (50 Years of Japanese Broadcasting, 1977). It was no wonder that the Japanese Navy took a strong interest in wireless communication. In fact, it was recorded that the decisive victory in the famed Battle of Tsushima was due to a wireless message from a patrol ship which had spotted Russia's great Baltic Fleet armada in the seas off Kyushu (ibid.). In this environment, Western culture and technology were received with enthusiasm. The ultimate aim was to reach parity with such countries as Britain, France, Germany and America (ibid.), although debate over Westernisation versus traditionalism was later to become an issue in Japanese history (Elzinga and Jamison, 1986). Nevertheless, the foreign influence on domestic affairs could not be denied (reason 3.).

After War World I, the Japanese private industry took a hand in this emerging new technological field. Under the Wireless Telegraph Law enacted in 1915, anyone who had obtained government clearance could transmit and receive radio signal (Ito, 1986). As competition became fierce, the Japanese government saw a need to regulate and to be put in control of radio broadcasting. This plan was further facilitated by a devastating earthquake that took 150,000 lives. Rumors and confusion following the earthquake were later attributed to a lack of genuine information and complete disruption of standard communication services (50 Years of Japanese Broadcasting, 1977). After the earthquake, later in December, 1923, the Ministry of Communications promulgated "Regulations on Private Radio-Telephone Broadcasting Facilities", which 'clarified official government concepts on the sociological impact of radio' (ibid., p. 15). The government would have run radio broadcasting as a public entity but for one reason: lack of financial investment. It was thus decided that a government-regulated corporation should be established. In November, 1924, the first broadcasting company in Japan, Tokyo Broadcasting Station was born (ibid.). For the first time in Japanese telecommunications policymaking, economic considerations made its trace in the process.

World War II destroyed almost all of the Japanese telecommunications infrastructure. The reconstruction of the telecommunications facilities became one of the salient issues on

the Japanese political agenda (Ito, 1985). To achieve this urgent goal, several steps were taken. First, to ensure organizational efficiency, the Ministry of Communications was divided in 1949 into two separate Ministries: the Ministry of Postal Services and the Ministry of Telecommunications.

In 1952, the Nippon Telegraph and Telephone Public Corporation (NTT) was established and operated as a monopolistic public corporation that provided Japan's domestic telecommunications services. NTT took over responsibility from the government for providing the telecommunications services needed for the postwar economic reconstruction. In addition, like AT&T in the United States, NTT had public responsibility for providing "telephone communication throughout Japan immediately upon dialing " and "telephone installation immediately upon request" (Uehara, 1989).

As in the United States, in the late 1960s, the integration of telecommunications with data processing brought about a revolution both in services provided and social demand. Various kinds of new telecommunications media, such as data and facsimile communications, began to make their way into the society. Specifically, the Japanese computer industry saw the integration as a good opportunity to expand their territory because the integration entailed the integration of products and services as well as the telecommunications and information technologies. In 1971, a major change in telecommunications policy took place in the area of data transmission. The 1971 amendments to the

Public Telecommunication Law allowed the use of leased lines for computer time-sharing connections and for certain other data applications on a share-use basis (Kalba, 1988). The desire of the computer industry to enter the field was thus a strong variable in restructuring the Japanese telecommunications sector.

Moreover, because of the abundant resources resulting from the convergence of the telecommunications technology and computing technology, interest groups other than the computer industry sought to enter this potential profitable market. For instance, on the supply side, the list of suppliers include traditional suppliers such as NTT, Fujitsu, Hitachi, NEC, Oki, new entrants from the electronics industry such as Matsuchita, Mitsubishi Electric, Ricoh, Sony, Toshiba, specialized telecommunications equipment companies such as Anritsu, Iwatsu, Nitsuko, Tamura and satellite communications companies. In addition, there are other joint-ventures with the U.S. and other Western countries , even entities from the public sector such as Japan National railways, Japan Public Highway Corp and various participants from valued-added networks and resellers (Kalba, 1988).

These quantum advances in technologies were coupled with the broadly publicized vision of the coming of the Johoka Shakai in Japan (See Ito, 1981). The increasing importance of the telecommunications sector in the future economic system, both domestic and international, challenged the traditional concept about the role of telecommunications. Cultural and social

objectives are still important considerations in making telecommunication policy but are no longer the major considerations. Ito (1986) vividly describes the battle between the "communications policy" and "industrial policy" in Japan. The former is represented by communications scientists in the Ministry of Posts and Telecommunications (MPT) and the latter by the economists in the Ministry of International Trade and Industry (MITI). The deregulation and privatization of the telecommunications sector in Japan is seen as a victory for MITI in its battle with the MPT. In other words, the economists in MITI have made the government and the public believe that telecommunications has such an important economic value in the national development that it cannot afford not to subject it to economic rules. They argue that only by competition will resources best be allocated; each business entity will be most efficient and the telecommunications industry will be best organized (Ito, 1986)

It is thus again a national consensus or, in Kas Kalba's term, "the confluence of forces" that facilitated the policy change. These forces "in favor of a more open and more diversified telecommunications market in Japan outweighed those in favor of maintaining the status quo" (ibid. p.96).

As in the United States, the policy changes in the telecommunications sector were undertaken in the name of public interest, namely, "improving customer services through more effective management" (Uehara, 1989, p. 67). Efficiency to serve

the public clearly stands out here as an argument for restructuring the sector by introducing competition and privatization. There seems to be an inherent relationship between the two: competition and privatization. However, as David Heald (1988) points out in discussing the privatization of the British Telecom that "Indeed, if the twin propositions about efficiency are accepted unreservedly (i.e. private enterprises are inherently more efficient and competition breeds efficiency), the public non-market sector ought to be at the center of enthusiasm for privatizing..." (p. 32). But the nature of the telecommunications sector is different from other traditional public sectors. It is technology-sensitive; it combines both social and economic roles into one fabric. It follows that if the technology changes and the balance of social and economic roles of the sector change, the pressures for policy change are to be expected. Once the policy change is initiated, it will in turn, further facilitate changes in technology and the balance of social, political and economic forces. In this sense, efficiency is being used as an excuse to conceal more fundamental changes in the relationship between the telecommunications sector and the society as a whole. Indeed, in the first year after the breakup of AT&T, there was confusion over the question: why a system that had worked so well had to be changed (Maremont, 1984).

The privatization of the Japanese telecommunications sector is therefore a consensus of the government, the entrepreneurs,

the big users and the general consumers. This, of course, does not mean that everyone is happy about the privatization. The nature of telecommunications dictates that its social and political implications are never to be ignored. For example, the privatization of NTT met with resistance from the labor union which was fearful of a labor cut at NTT. Their fear was justified since in the 1985 fiscal year, NTT decreased its total number of personnel by about 10,000 persons, and in the 1986 fiscal year, it achieved a further decrease of 6,000. There was also political concern that the privatization and the resulting competition would lead to cream-skimming practices at the expense of the residential users (Kalba, 1988). There is also institutional conflict between MPT and MITI about the central role that they will play in the telecommunications sector (Kalba, ibid. ; Ito, 1986). The balance of the forces, however, is toward the change. On the part of the government, the privatization fulfilled three major objectives:

1. To shift the responsibility of allocating profit and resources to the private sectors and the competitors and at the same time to promote the development of the sector, while maintaining its necessary political and regulatory control.
2. A related objective is to shift the pressures of meeting the public demand for the telecommunications services to the enterprises involved and to avoid the direct tension between the government and the public.

3. The privatizing of NTT, whose stock is being sold to the public, gives the government financial benefit to support other social and political objectives and at the same time relieves the budgetary burden on the part of the government to promote sector development.

On the industries' side, telecommunications represents the future of the national economy and is thus a sector that they need to gain a foothold. For the traditional telecommunications entities, they do not want to be confined to the plain old telephone services (POTs), privatization would release them from old regulatory restrictions and enable them to compete in the more promising enhanced service area. On the consumers' part, especially for big users, competition means more choices, flexibility and more bargaining leverage. For entrepreneurs, deregulation provides them opportunity to enter this profitable sector and to compete on a more fare ground.

VII. Implications for China and other developing countries

The government and the telecommunications entities of the developing countries are facing complications in addition to those being felt throughout the industrialized countries:

1. The United States and Japan (and other industrialized countries) built their basic national networks during the era of relatively unchallenged monopoly control, a period without a counterpart in developing countries.

2. The enormous amount of capital to build the national networks. In the North America and Japan, the capital plant of the public networks is worth roughly a trillion U.S. dollars (Nulty,1989).
3. The new pressures to be competitive reached U.S. and Japan only after universal national networks had been built.

In China, telecommunications, both broadcasting and POTs, has traditionally been regarded as a power extension of the Chinese Communist Party. It was natural that the Party and its government exercised tight control of the telecommunications sector. The development of telecommunications is thus closely linked with the political climate over time. Up to 1978 when the ambitious "four modernizations" drive began, telecommunications underwent very little progress due to political upheavals such as the Cultural Revolution. For instance, in 1979, there were only eight million black-and-white TV sets nationwide, compared to the startling figure of one hundred million (including 25% color sets) in 1988 (Thirty Years of CCTV--From 1958-1988). Telephone penetration was 0.1 per one hundred persons in 1979, and rose to 0.6 in 1988 (Paxton, 1988).

The "four modernizations" drive is the result of recognition from the government that economic success is a vital element determining political survival. Like Japan after War World II, China after the Cultural Revolution faced the urgent task of economic recovery. Telecommunications is believed to occupy a

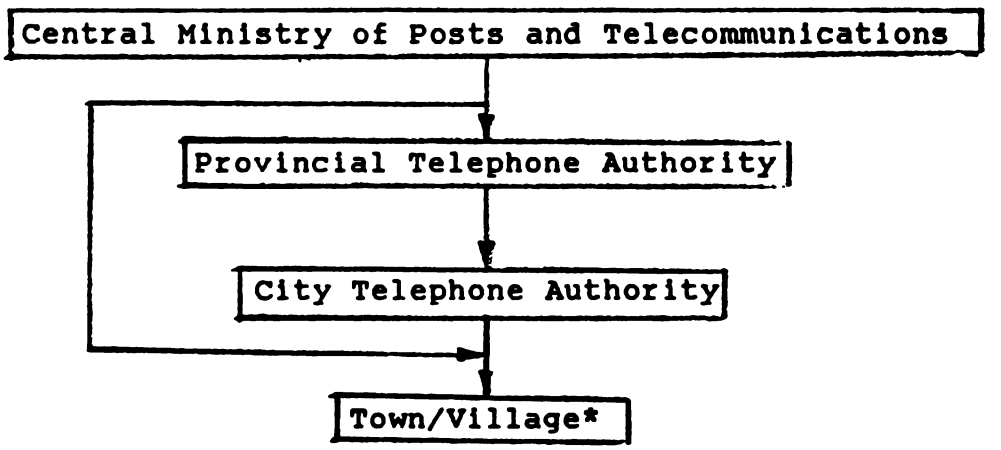
central position in this economic reform. As Lerner (1987) observes:

> The goal for telecommunications policy in China is to stimulate growth in the telecommunications sector which exceeds growth required for overall "national recovery." This policy recognizes that overall economic growth cannot be sustained unless the economy's supporting structures, including telecommunications, grow at an even greater rate (p. 33).

With this recognition, the development of telecommunications has been put on the top list of political agenda. Advertising, which has been regarded as Western "rotten" consumerism, was introduced in 1979 in broadcasting to promote commercialization of goods and services. The introduction of advertising was seen as a natural result of the new economic policy, namely, introducing marketplace economy into the economic structure and decentralizing the administration and management. Moreover, the rising demand for the expansion of broadcasting came at the time when the government budget was tight. The introduction of advertising released part of the government obligation on financial matters.

Similarly, the Chinese government regarded the development of a telephone infrastructure as an essential element of her modernization drive. The development of telephone infrastructure

has therefore been prioritized by those Special Economic Zones as a way to keep and attract foreign investment and promote other sector development (Lerner, 1987). While China's telephone industry still emphasizes central planning and management, considerable power has been delegated to the local authorities as a result of the decentralization reform. These provincial, metropolitan authorities have been given more freedom to plan, develop, regulate and operate the telephone service (Telecommunications Policies in Ten Countries, 1985). Figure 8 (see Lerner, 1987, p. 33) shows the hierarchial structure of the Ministry of Posts and Telecommunications.



* Jurisdiction for rural telecommunications varies by region.

Figure 8: Telecommunications Hierarchy in China

The decentralization is intended to give the local authorities more freedom and flexibility to pool whatever capital they can

obtain to boost the development of telecommunications. Each Chinese province has its own Posts and Telecommunications organization and offices. The decentralization, combined with the MPT's limited ability to finance the local authorities, reduced considerably the MPT's control over the local Posts and Telecommunications Authorities. Moreover, MPT has no control over the other private and governmental organizations who are free to plan, acquire and operate their own private dedicated or switched systems independently of the MPT and its systems (Lerner, 1987). These governmental ministries and private organizations are impatient about the slow construction in Posts and Telecommunications and began to develop their own communications facilities to satisfy their individual needs. These include the Ministry of Water Resources and Electric Power, Ministry of Railroads, Ministry of Petroleum, the People's Liberation Army, the Broadcasting and Television Ministry (Telecommunications Policies in Ten Countries, 1985). This resulted in a variety of diversified systems, nonuniform technical standards, overlapping use of frequency bands, uncoordinated management policies, as well as the criss-cross of underground pipes and cables, randomly installed telephone pipes, and interfering air waves. Consequently, the quality of communications is adversely affected.

These problems in China raised important questions for other developing countries since they share the same task of building the national telecommunications infrastructure in order to boost

the development of other economic sectors. In their effort to promote telecommunications development, China and the developing countries face the following paradoxes and dilemma:

1. On the one hand, telecommunications entities in developing countries face the enormous task of building and upgrading the national network. The capital needed for this task is similarly tremendous. On the other hand, there is a need to respond more quickly to the rapid technological changes in other enhanced telecommunications systems. In addition, there are pressures from other governmental ministries and large private business users for more efficient, fast and non-expensive services. All this leads to strong pressures for decentralization and liberalization in the telecommunications sector. The result is the potential diseconomies of proliferating and fragmented systems, and loss of revenue for the MPT to cross-subsidize extension of the basic network. Loss of revenues from large customers looms even larger as a problem than it does in industrialized countries because the proportion of total traffic concentrated in such customers is greater.
2. It is very difficult for telecommunications entities in developing countries, in their current form and condition, to provide the services large customers need and demand. If telecommunications entities and governments respond to the dilemma by forbidding alternative systems without being able to provide the services themselves, the customers--- and

ultimately the country---will suffer.

3. Because of the budget problems in China and other developing countries, the urgency to boost the telecommunications development will orient the government toward a competitive and market-driven policy. But a purely market-driven system of allocation will tend to produce a system that concentrates disproportionately in the main cities and on the largest and wealthiest customers. This concentration causes political problems and can impede the realization of important development goals, such as the decentralization of economic activity and the development of rural areas.

In view of these facts, it makes sense for developing countries to evolve toward a telecommunications sector that includes both a publicly owned, pervasive network providing basic services and one or more privately owned installations or restricted networks that provide highly sophisticated facilities and transmission to high-volume business customers. There are important legitimate reasons for public ownership of a switched network in a developing country setting. Traditional government priorities such as security, emergency preparedness, and economic development will still have a great influence on the location and capacity of a telecommunications system. These priorities can dictate a system radically different from a network designed to maximize profit. The scope of a government network must encompass every population center and geographic area of a

country, not just densely populated areas or industrial facilities.

There are equally compelling reasons for the existence of private owned telecommunications facilities or networks of restricted scope. A limited number of highly sophisticated large-volume enterprises can use the latest communications technology. These enterprises usually have the financial and political strength to demand frequent replacement of dedicated transmission equipment and equipment on customers' premises as technology advances.

A telecommunications system combining public and private facilities can realize the following benefits:

1. Capital costs of the public system would be reduced by avoiding widespread installation of technology that is used by only a few customers; they would also be reduced by using switching and transmission capacity made available when business customers leave the public network to be served privately.
2. Access to state-of-the-art communications facilities provided by responsive profit-oriented operating entities at market process offers strong incentive for foreign investment in new business of industries.
3. The risks of premature obsolescence or price cutting in the equipment or transmission facilities provided to high-volume customers are borne by private capital.

4. Rapid and unpredictable fluctuations in the demand for sophisticated high-volume telecommunications services need not be anticipated in national budget planning.

These benefits can only be fully realized, however, when privatization is both economically and politically feasible. In countries, where privatization of the telecommunications entities is currently not politically feasible, other forms of restructuring can be implemented. China, for example, can choose decentralization of finance and management authority to the local government. These local telecommunications administrations will then function as relatively independent organizations with the central MPT coordinating and supervising the technical standards. These local administrations will be required to be responsible for putting the universal access as their first priority. After this, they are free to plan and develop other advanced telecommunications technologies. This implies that a limited competition between the local telecommunications administrations is possible

The current telecommunications policy in China seems to head toward this direction. Those provinces and cities that have more financial resources are developing at a much faster speed than those that do not. For example, many new services and facilities are available now only in the more prosperous cities and Special Economic Zones (see Table 2) (Lerner, 1987, p.139). Cities such as Beijing, Shanghai, Guangzhou and Shenzhen all have telex,

facsimile and data communications. Some, like Beijing, have cellular radiotelephone.

Table 2 : ECONOMIC PRIORITY CITIES, ZONES AND REGIONS

Municipalities:	Beijing shanghai Tianjin	
Special Economic Zones:	Zhuhai Shenzhen Xiamen Shantou	
Coastal Cities:	Dalian Qinghuangdao Tianjin Yantai Qingdao Lianyungang Nantong	Shanghai Ningbo Wenzhou Fuzhou Guangzhou Zhanjiang Beihai
Coastal Regions:	Long River Delta Pearl River Delta Xiamen-Zhangjian-Chuanzhou Delta	

China and other developing countries do have some opportunities not enjoyed by the industrialized countries. The experiences in the industrialized countries provides options of making telecommunications policy. This, however, does not mean that policymakers are forced to select any particular option or model. The choices are no longer limited to a monopoly environment and unrestrained competition in all facets of the telecommunications industry. In addition, new technologies provide an opportunity to leapfrog over some of the most expensive and difficult phases of telecommunications development.

Advanced radio and satellite technologies, for example, can temporarily or permanently forestall the need to hard-wire remote rural areas. The developing countries can also bypass the expense of phasing out the established electromechanical systems and go directly to such digital systems as Integrated Services Digital Network (ISDN).

VIII. Conclusion

Virtually all telecommunications reforms being considered by governments around the world involve some reduction in the monopoly control of the traditional telecommunications entity and some increase in the influence of market forces over operations and investment in the sector. This similarity does not reflect any common ideology; governments of all political inclinations are examining very similar reforms. Rather, the resemblances have to do with the nature of the technical, economic, and political forces bearing down on the sector. The market orientation of the telecommunications sector can be increased by allowing new entrants into the sector, by changing the way in which the existing entities operate, or by doing both.

Despite the increasing pressure for more commercial modes of behavior, however, telecommunications remains an important public good with powerful social and political implications that cannot be ignored and cannot be entirely subjected to market forces.
In the traditional telecommunications sector, most policy issues were internalized within the telecommunications entity. The

monopoly provider, often explicitly a part of the political process as a ministry of government, had the capacity both to make the necessary tradeoffs, so that social and political considerations were balanced with economic efficiency, and to make its decisions stick through legal market powers.

These traditional mechanisms for balancing conflicting interests are losing force. The pressures of the new environment, moreover, are reducing the power (political, legal, and market) of the established telecommunications entities and forcing them to give greater weight to economic considerations and less to political and social considerations.

In a world that change is accelerating with great force, however, it is increasing difficult to predict and plan. The cycle of change has become shorter and shorter. This sensitivity of change and unpredictability characterizes the field of electronic technology. Policy-making becomes more difficult and at the same time assumes vital importance. It took the FCC some fifty years to realize that deregulation might be better for the telecommunications sector development. There is an old Chinese philosophy which says: "After a long reunion comes separation; after a long separation comes reunion. This is the law of cycle." In this view, Mainland China and Taiwan will be reunited and so will the two Koreas and the two Germanies. In the same light, the Soviet bloc will depart from each other and become independent from Soviet control. Applied to the telecommunications industry, because long-time monopoly may result in bureaucracy,

non-innovativeness and inefficiency, competition has to be introduced to break the monopoly and to stimulate the vigor and vitality within the status quo. On the other hand, competition may result in the waste of resources, time and money, abuse of public interest, and tension between the competitors that eventually will lead to compromise, cooperation or mergers.

In "order" is embedded the chaotic elements and from "chaos" the "order" is born. The art of making a national telecommunications policy is the art of preventing "chaos" while creating a new "order" and/or creating a new "order" without producing "chaos".

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