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THE CHARACTERISTICS OF CHINA"s TELECOMMUNICATIONS MARKET AND STRATEGY: INSTITUTIONAL PARADIGM

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THE CHARACTERISTICS OF CHINA's TELECOMMUNICATIONS MARKET AND STRATEGY: INSTITUTIONAL PARADIGM

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ABSTRACT

THE CHARACTERISTICS OF CHINA's TELECOMMUNICATIONS MARKET AND STRATEGY: INSTITUTIONAL PARADIGM

By

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The dramatic growth of the telecommunications economy has encouraged many researchers to try to explain the relationships between telecommunications and economic development. The studies, until recently, have viewed telecommunications as a consequence rather than a cause of economic development. However, telecommunications are now widely considered to be a strategic investment to maintain and develop competitive advantages over other nations. Telecommunications facilitate the development of an economy by improving efficiency, effectiveness, and the distribution of benefits throughout society.

This paper uses China as a case study to examine factors that promote telecommunications development. By using Chitty's Strategic Freedom Model, China's telecommunications industry is analyzed in terms of market characteristics and development strategies. This study found that China's telecommunications have developed by facilitating full degree of strategic freedom, which is allowed by favorable market characteristics. Since the general economic reforms in 1979, China has adopted four strategies concurrently: importing technology through MNCs; local production of imported technology for export and domestic markets; development of local technology for domestic markets; and marketing locally developed technology overseas. China's full strategic freedom has been made possible because of the market characteristics, such

as a big domestic market; easy access to substantial financial resources; relatively good quality of industrial and infrastructural base; and a high level of manpower even though its market is not as mature as that of developed countries.

The results of this research reveal that there are no generalizations in economic development. Each country not only has its own market characteristics and a different degree of strategic freedom but also utilizes the freedom in its own way. It is suggested that a country, which is pursuing telecommunications development, precisely analyze its own market, in order to understand its present and potential market characteristics, and decide on the strategic option(s) most appropriate to its market.

To
My Family
For their love

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INTRODUCTION

Statement Of Purpose

Today information is regarded as a fundamental factor of production, alongside capital and labor. Its importance in many economies has grown steadily. Information accounted for one-third to one-half of the Gross Domestic Product (GDP) and employment in OECD countries in the 1980s, and is expected to reach 60 percent for the European Community in the year 2000. Information also accounts for a substantial portion of GDP in the newly industrialized economies and the modern sectors of developing countries (Wellenius & Stern, 1994).

This dramatic growth of the information economy has encouraged many researchers to try to explain the relationship between telecommunications, which is seen as a tool for transferring information, and economic development. For instance, the supply and demand of telecommunications are linked to the level of economic development of a country (Jipp, 1963; CCITT, 1972; Hardy, 1980; Pierce and Jequier, 1983). Similarly, diffusion of computers is related to the development of the nonagricultural sector of the economy (Han, 1978; Stoneman, 1976; and Chow, 1967). These studies, until recently, have viewed telecommunications as consequences rather than a cause of economic development. However, telecommunications are now widely

considered to be a strategic investment to maintain and develop a competitive advantage at all levels, including national, regional, and firm (Wellenius & Stern, 1994; Hudson, 1990). Telecommunications facilitate the development of an economy "by improving efficiency, or the ratio of output to cost; effectiveness, or the quality of products and services; and equity, or the distribution of benefits throughout society." (Hudson, 1990, p167)

Three frameworks which have been most commonly used to study the role of telecommunications in economic development are the modernization, radical, and institutional paradigms. "Different foci, inferences, and conclusions resulted from research, depending on the research paradigm," which was selected (Taylor & Omura, 1994, p66). In this paper, the actual developments in the People's Republic of China are contrasted with the expectations of the institutional paradigm. Institutional paradigm is selected because its analysis more closely matches the reality of China's telecommunications industry and allows for a richer description of China's telecommunications development than do the other two paradigms.

China is now considered to be one of the most attractive markets in the world. China's current double-digit growth rate, and the huge potential as a market for telecommunications equipment and services, makes China hard to be overlooked by both researchers and multi-national corporations. However, two decades have not yet passed since its invitation to invest was declined by foreign companies. AT&T, for instance, rejected China's request to examine the possibility of establishing a joint switch

manufacturing venture with PTIC in 1979 assigning reasons such as political instability and a frustrating rate of economic growth (Warwick, 1994, p267).

Therefore, this paper first analyzes the factors which promoted this rapid development in China's telecommunications in terms of market characteristics and development strategies. Second, this paper examines the impact of telecommunications on China's economic development to prove if the role of telecommunications is always positive in an economy, as many current economists maintain.

Research Questions

China is a particularly rigorous test case, since it is an eastern culture with a unique history and a value system unlike that of any Western and/or Capitalist country. Furthermore, since China has become increasingly competitive in the world's telecommunications industry, understanding its success should be of particular interest to researchers and policy-makers in other countries.

The study of China's telecommunications development is also important. At a practical level, China has a significant impact on the well-being of over a fifth of the world's population, world trade, the evolution of the Asian-Pacific economy, and on the international balance of economic power (Fewsmith, 1994). At a theoretical level, China illuminates processes involved in the transformation of economic systems and the relationship between economic growth, political systems, and institutional and technical changes. The nature of "Asian" models for development can be readjusted by examining the Chinese case, which is fundamentally different from that of other Asian countries.

To accomplish the research purposes stated above, the questions guiding this research may be stated as follows:

RQ 1: What development strategies has China adopted in the telecommunications sector?

RQ 2: What kinds of relationships exist between telecommunications development and institutional arrangements in China ?

RQ 3: What is the impact of telecommunications on economic development in China ?

Research Methods And Data Sources

The analytical technique employed to examine these research questions is "document research." Published journal articles, books, archival records or graphs, and other publications are either analyzed or synthesized to show the explicit and implicit characteristics of China's telecommunications market, and to provide specific examples of China's development strategies and telecommunications policy. While admitting the limitations on access to information in the field of China's telecommunications market, this paper will make the best use of statistical databooks published by international organizations such as Asian Development Bank (1992), World Bank (1994), and ITU (1992).

However, the remainder of the evidence supporting this research argument will be pulled from secondary literature. Specifically, institutional changes (such as the educational system, the industrial relations system, managerial and corporate structures, the financial system, the pattern of investments, and the legal and political framework at regional, national and international levels) are related to telecommunications

development (Xu, 1994; Chang, 1994; Lu, 1994). The characteristics of China's market are also linked to the changes in telecommunications development strategies (Ure, 1994; Sun, 1991; Gu, 1991). The investment in telecommunications is related to the development of the economy (Zhao, 1994; World Bank, 1994; Hardy, 1980).

LITERATURE REVIEW

In order to analyze the patterns and reasons for telecommunications development in China, three paradigms-modernization, radical, and institutional-are evaluated in terms of their ability to fully explain China's telecommunications development. This evaluation is important because it guides a researcher to select the most appropriate paradigm for subsequent analysis (Taylor & Omura, 1995). The six evaluative criteria to be used, presented in Exhibit 1, "serve as measures to assess the explanatory power" of the three major paradigms of telecommunications development. These six criteria were initially suggested by Taylor and Omura (1994) to be used in evaluating development paradigms in the marketing area. Their ability to assess paradigms was once examined by applying them to the economic development in the Republic of Korea (Taylor & Omura, 1995). This paper will adopt Taylor and Omura's framework and try to apply it to a different context, that of China's telecommunications development. It is meaningful to examine the same framework in two different fields of study (marketing and telecommunications), which are located in two extremely different situations (Korea and China).

Exhibit 1. Desirable Characteristics Of An Analytical Technique For Examining Economic Development

1) Behavioral Interdiction	Describes the behavioral elements of development, including entrepreneurial, government, and MNC intervention.
2) Historical Perspective	Takes the long view on development to recognize dynamic change and avoid contemporary biases.
3) Multidimensionality	Considers economic, as well as noneconomic (social, political, psychological), factors.
4) Apoliticalness	Avoids chauvinistic or cultural bias of research.
5) Nonuniversality	Recognizes that local and ethnographic conditions constrain or facilitate development.
6) Internal and External Forces	Recognizes that forces, both internal and external, to a country may play central roles in its development.

Source: Taylor & Omura (1994, p8)

The behavioral factors, such as the role of government (Hall and Preston, 1988; Sinha, 1992 Cook, 1989), enterprise (Noll, 1986; Deyo, 1987), and the role of MNCs (Jussawalla, 1995; Muella, 1993; Lewis, 1992) are proven to have relationships with telecommunications development in several countries. With guidance from the local government, MNCs have contributed to foreign, direct investment and to the transfer of technology. These corporations have either established subsidiaries in the region or have teamed up with local enterprises to create joint ventures. The historical background of a specific country cannot be ignored when explaining different patterns and results of telecommunications development. History determines the dynamic nature of telecommunications' structure, operation, and regulation (Straubhaar, 1995; Headrick, 1991; Mody & Tsui, 1995). Multidimensionality is critical for researchers to understand the telecommunications development because the telecommunications development is a function, not only of economic variables, but also of political, psychological, and social

factors (North, 1990; Noll, 1986; Freeman, 1984). Apoliticalness helps researchers to avoid the chauvinistic or cultural biases when they analyze telecommunications development in a specific country. A researcher's own value system or personal ideology can interfere with the objectivity of the analysis (Salwen, 1991; James, 1992). Nonuniversality along with historical perspectives are also emphasized as important factors in explaining the telecommunications development in the developing countries (Mody and Tsui, 1995; Straubhaar, 1995). The use of the term "nonuniversality" here may be misleading as self-contradictory to the nature of theory, which should be applicable in any situation. However, the word nonuniversality represents the boundary conditions for bureaucrats and politicians. Regulations are set by the national and local context of class and ethnicity which is neither universalistic nor deterministic (Taylor & Omura, 1994). Finally, both internal and external forces have an influence on the telecommunications development (Barrera, 1995; Casasuz,, 1990; Tandon, 1992; Ambrose et al, 1990). Telecommunications development have been determined by the relationships between domestic and foreign governments, international organizations, domestic and foreign capitals, and workers. These six criteria are not exhaustive as measures to evaluate the development paradigms. One cannot outline all of the factors involving telecommunications progress in a specific country. However, the above-stated six criteria promote a relatively richer and accurate explanation of the telecommunications development, while serving well as criteria to evaluate development paradigms.

Evaluation Of Modernization Paradigm In The Context Of China's Telecommunications Development

The modernization paradigm assumes that countries pass through the evolutionary stages of growth along a continuum from tradition to modernity (Lerner, 1958). The latter is typically assumed to be ideal. An important tenet of the modernization paradigm is that the experiences of the countries that have successfully evolved through the stages of growth are replicable as guides for economic policy in those countries which are at earlier stages of development.

Modernization theorists in the telecommunications field argue that the problems in the Third World can be solved in the same way as in the developed world, where the essential factors are the diffusion of information and telecommunications technology (Lerner, 1958). Therefore, the similarity of values and systems of the West are measured and evaluated as reasons for the societal success of the Third World. The main direction of socio-cultural trends that were successful in the West are idealized as concepts of development in the modernization paradigm. It extrapolates from a particular historical sequence in the West to other cultures and contexts in the Third World by observing a certain period, framing it into some hypothetical time scale, and then assuming a development sequence as an established fact. It is thus, "a historical, deterministic, and predictive in intent and outcome" (Kumcu, 1987; Joy & Ross, 1989, p18).

While this approach fits fairly well with the newly industrialized countries, the depth of its analysis is somewhat limited to a few internal factors (Taylor & Omura, 1995, p83). Despite the fact that the modernization perspective stresses the importance of

the Western impacts on the Third World's social change, the basic historical setting for modernization is the nation state. This allows scholars to easily overlook the worldwide context and the influence of outside power factors, which also account for the relative underdevelopment of a nation (Black, 1966).

In this context, the modernization paradigm performs well on "Behavior Interdiction" criterion (Taylor & Omura, 1995, p83). Such behavioral factors as the role of government, domestic or foreign companies, which are central to the modernization paradigm, also help explain the development of China's telecommunications. The main role of the Chinese government, in spurring innovation and encouraging behaviors that promote telecommunications development are well considered in the modernization paradigm.

The modernization paradigm does not perform well on the "Historical Perspective" criterion (Taylor & Omura, 1995, p83). This approach undermines the fact that China's telecommunications development has "unique and distinct" characteristics which are different from those of Western countries (Taylor & Omura, 1995, p83). The literature in this approach assumes that the values, institutions, and patterns of action of traditional society are both an expression and a cause of underdevelopment and constitute the main obstacles in the way of telecommunications development (Lerner, 1958).

Regarding noneconomic factors, the modernization paradigm does not perform well (Taylor & Omura, 1995, p84). This approach suggests that by supporting the rejection of traditional values and adoption of new ideas, telecommunications technology and institutional structure will solve most social problems (Lerner, 1958). However, it is

clear that many factors still exist in China, including family planning, the regional gap between urban and rural areas, and bureaucracy, which the modernization paradigm does not pay attention to, but influences the development of telecommunications. This approach does not necessarily include those factors that affect the social and psychological value of life.

In addition, Talyor and Omura conclude that a Western bias is involved in the modernization paradigm, while performing poorly on the "Apoliticalness" criterion. Even though there are some variations among cases, this approach shares consensus that to solve problems and achieve development, Third World countries need the same strategies and conditions as the West had at the time those nations developed telecommunications. This Western bias is implicit in the modernization paradigm and reflects its origin as a study. After World War II, U.S. policy-makers tried to revive world trade and encouraged many scholars and academies to become involved and obtain government and private funding for projects that dealt with the economic development and modernization of underdeveloped societies (Form, 1979; Walton, 1987). However, China's experience shows that its development conditions, patterns, and results are different from those of the Western world. This uniqueness is attributed to its own cultural, political and economic value systems. Kinship or social obligation, for example, still determines the morale of Chinese workers, rather than individualism and competition.

Modernization theorists assume that Chinese society will converge toward a common destination dictated by the technological and organizational imperatives of

advanced industrialization. By promoting the same cultural and institutional transformations, all Chinese can follow the Western pattern of telecommunications development. In a nutshell, the modernization paradigm aims to be universal in terms of its law-like applications across various time and cultures (Bartels, 1981; Kumcu, 1987). In reality, however, China's telecommunications development have been driven by the more complex and invisible interactions among traditional and modern values. Both centrifugal and centripetal forces of Chinese society are complicatedly mixed with such factors as Confucian hierarchy and Communism equity values, and one strong central government and a vast territory inhabited by various tribes with their own languages, cultures, and customs. The modernization paradigm does not consider these specific contextual, historical, or structural factors very well, which are not universalistic.

In terms of "Internal and External Forces," this approach performs moderately well (Taylor & Omura, 1995, p84). Modernization theorists evenly emphasize the internal and external forces, which are involved in the process of diffusion of ideas and technology. Government or early adopters of traits and characteristics of developed countries have played the role of decision makers in the acquisition and diffusion of new telecommunications technology. Telephones or computer modems, for example, were first acquired by military, political elites, universities, and business enterprises in China. External players, such as foreign governments and Transnational Corporations (TNCs), also affected China's telecommunications development through loans, technology transfer, and the exportation of regulations and organizational structures. However, this paradigm attributes all the changes in China's telecommunications to the result of

exogenous stimuli, such as the diffusion of modern values and institutions from the early telecommunications modernizers. During the process of internalization development, China is assumed to follow a certain pattern, such as Rostow's stages of growth: Traditional Society, Transitional Society, Take-off, Technological Maturity, and High Mass Consumption.

In summary, the modernization paradigm performs relatively well on "Behavioral Interdiction" and "Internal and External Forces" criteria but not well on "Historical Perspective," "Multidimensionality," "Apoliticalness," and "Nonuniversality" criteria.

Evaluation Of Radical Paradigm In The Context Of China's Telecommunications Development

The radical paradigm downplays the assumption made by modernization theorists that "the unit of analysis in studying underdevelopment is the national society" (Valenzuela & Valenzuela, 1978, p25). This paradigm assumes that "the development of a national or regional unit can only be understood in connection with its historical insertion into the worldwide political-economic system" (Valenzuela & Valenzuela, 1978, p25). As all economic activities tend to have more international components in terms of both production and consumption, the radical paradigm provides a particularly useful framework for studying telecommunications and economic development. According to the radical paradigm, advanced core countries attempt to reinforce their competitive position and underdeveloped peripheral countries, unsuccessfully, try to

become more competitive because their economy is conditioned by dominant countries (Taylor & Omura, 1995; Valenzuela & Valenzuela, 1978).

Some scholars argue that the social, political, and economic costs of dependent industrialization of telecommunications in the Third World are high (Flacks and Turkel, 1978; Nash, 1981). Peripheral economies in telecommunications are so dependent on the core's market, capital, and technology that a large proportion of the annual income leaves the country, which further impedes the growth of capital stock in the poor countries (Veltmeyer, 1980). This movement creates an internal class structure characterized by extreme disparities of power and wealth, as well as a dualism of the productive structure (Valenzuela & Valenzuela, 1978). Elite in the Third World prosper from the dependent development of telecommunications and are rewarded for their association with international capital.

Based on the six evaluative criteria, however, a number of concerns emerge. With regard to the "Behavioral Interdiction" criterion, disadvantages implicit in the advantage of the radical paradigm are revealed. The emphasis on the world system makes internal factors easily overlooked in explaining the telecommunications development in China. External forces are fully considered and their behaviors are well explained in the context of China's telecommunications development. However, the paradigm does not give adequate consideration to domestic behavior, such as "the role of innovation and entrepreneurship" (Taylor and Omura, 1995, p84). The radical analysis of the telecommunications development in China stresses the dominant local groups, who have tended to favor the association with external capitals to preserve their own interests, and

the dominated massive population whose situation is exacerbated by the dual exploitative structure. However, little emphasis is given to the mutual beneficiary effect that resulted from cooperation between foreign capitals and local entrepreneurs. In reality, China's telecommunications benefit from the joint ventures and foreign direct investment in terms of technology and finance. The radical paradigm also neglects the positive role of the Chinese government, which promotes telecommunications development in the form of a five-year plan, trade barriers, and equal distribution of wealth with regard to telecommunications services.

The radical approach is strong in examining Chinese history as a part of the world system, but it is weak in paying attention to the unique aspects of Chinese history and their effect on telecommunications development. As an example, this paradigm does not provide an understanding of a society that is armed with Communist values and was isolated from the outside world for a long time. According to the radical paradigm, the domestic cultural and institutional features of China are, in themselves, simply not the key variables accounting for the relative laggardness of the area. The radical perspective assumes that China's telecommunications development can only be explained with its historical placement into the world system, which emerged with the wave of European colonization of the world. In reality, China's telecommunications development took place in the context of both its own history and the world system. In the pattern of the economic reform in 1979, telecommunications restructuring and deregulation have been closely related to the unique characteristics of Chinese history, such as potential power of

the military, consumer size, and the labor market, which is also determined in the world system.

The radical paradigm has a strong sociological background and performs well in its consideration of noneconomic factors. The analysis of radical perspective turns to broad aspects of social and psychological issues beyond economic factors, such as GNP or income per capita. Measures, such as working conditions, morale of workers, work ethics, equality, social welfare, literacy, and life expectancy, are used to determine the level of development in China (Valenzuela & Valenzuela, 1978; Taylor & Omura, 1994). Some radical scholars in the telecommunications area include such factors as standardization of technology; regulatory patterns and content; organizational structure; production know-how; and the value of practice (the attitude or assumption about what is appropriate or what is the usual way of going about things) which are following the Western style (Boyd-Barrett, 1980).

"The radical paradigm does not avoid political bias. By assuming that core nations exploit the periphery and that the leaders of peripheral nations perpetuate dualism, the paradigm predetermines the interpretation" (Talyor & Omura, 1995, p86). Therefore, China's substantial economic progress since the economic reform in 1979 cannot be explained with the radical paradigm. It appears that due to its political bias attributing the underdevelopment of the Third World to the external exploitation and internally associated-dependency, the radical paradigm causes somewhat inaccurate analysis of the telecommunications development. This is especially true in a Communist country such as China, which, until recently, has been less involved in the web of global

systems and has distributed the fruits of economic development in a more egalitarian fashion than have most developing countries, the radical paradigm loses its power in explaining telecommunications development.

Regarding the "Nonuniversality" criterion, the radical paradigm performs very poorly. Its focus is on explaining underdevelopment of the Third World and not on the functioning of capitalism. Therefore, the world in the radical paradigm is always divided into two groups, industrial, advanced or "central" countries and underdeveloped, backward or "peripheral" countries (Valenzuela & Valenzuela, 1978, p25). It assumes that telecommunications development in China should reflect in other peripheral countries. In fact, China has followed a unique pattern of telecommunications development while staying out of the world system. It has been excluded from the context of the capitalist's world system for several decades. Therefore, it is inappropriate to place China in the global structure with other peripheral countries. However, it is also true that the radical paradigm begins to gain power in explaining the dependent development of China's telecommunications industry. China gradually entered into the capitalist world system as it gave up its centrally controlled, socialist economy and self-reliance policy. It has also privatized its state-owned and operated telecommunications enterprises and permitted foreign investment in these sectors of business, except basic services. This policy shift makes China further dependent on the capital, technology, and thus, systems of the developed countries, as other peripheral countries do.

With consideration to the "Internal and External aspects" of telecommunications development, the radical paradigm does not perform well. This paradigm assumes that

telecommunications development in the Third World is confined to participate in the world system and results from its adjustment to the requirements of the center (Valenzuela & Valenzuela, 1978, p25). Therefore, the central role in China's telecommunications development is assigned to external factors, while the role of the Chinese people and government is understated. In China, internal forces have played an important role. For example, the role of the state in providing credit, channeling investment into particular industries, subsidizing export products, protecting the domestic market, and attracting new capital and technologies have been more important than that of foreign capital in telecommunications development.

In a nutshell, the radical paradigm performs quite well on the "Multidimensionality" criterion and somewhat well on "Behavioral Interdiction," "Historical Perspective," and "Internal and External Forces" criteria, showing the strength in explaining the telecommunications development in the context of the world system. However, this paradigm does not work well on criteria such as "Apoliticalness" and "Nonuniversality."

Evaluation Of Institutional Paradigm In The Context Of China's Telecommunications Development: Chitty's "Strategic Freedom Model"

"Institutional economics attempts to explain social institutions not from a historical or sociological framework but from a functionalist one" (Joy & Ross, 1989, p23). The institutional paradigm assumes that those organizations that are most appropriate in their economic conditions can survive. Chitty (1987) argues that a country

which chooses a strategy most suited to its market characteristics survives, and that the more strategic freedom a country has, the better it can develop. His version of institutionalism attempts to break away from the analysis of the abstract market and to focus on the relationship between specific market characteristics and the strategies available in that specific situation.

According to Chitty (1987, p214), "countries may develop telematic industrialization policies which scatter across a wide spectrum of possibilities" and their economic success is reliant on the adaptability of the strategy to specific environments. He identifies "a few Weberian 'ideal types' which have recognizable characteristics and whose properties lead to varying degrees of strategic freedom." The strategic options are:

1. To import technology from MDCs.
2. To produce/assemble foreign-developed components/appliances/software for factories/distributors in MDCs, with some spillover into the domestic market.
3. To develop technologies (hardware and/or software) for domestic and external markets.
4. To market locally-developed technologies in overseas markets.

> Countries with potentially high-volume domestic market, good access to capital, a sound industrial and infrastructural base, and trained manpower may be classified as Type A. These have the highest degree of strategic freedom, quantified here as 4, as all four of the above strategic options are available to them. Countries with disadvantages in terms of a size of domestic market and advantages in terms of all other categories also could have a strategic freedom of 4, but this is of a diminished nature

because of the absence of the generative power of a strong local market. They are classified as Type B countries. Countries with advantages in terms of trained manpower and a sound industrial base, and disadvantages in the other two areas, may be categorized as Type C nations. These have a strategy option of 2. Small countries which adopted 'basic needs' approaches to development early are likely to be found among their number. Type D countries suffer on all counts but trained manpower, and have a strategic freedom of 1. Their option is to use their manpower for production of components for foreign manufacturers, but in this they would have to compete with Type C countries, which have a better infrastructure. Type E countries have a strategic freedom of 0, being disadvantaged in all four areas (Chitty, 1987, p214).

Exhibit 2. Degree Of Strategic Freedom

COUNTRY TYPE	A	B	C	D	E
CHARACTERISTICS					
Potential volume of domestic market	high	low	low	low	low
Access to financial resources	high	high	low	low	low
Relative quality of industrial and infrastructure base	high	high	high	low	low
Level of manpower	high	high	high	high	low
STRATEGIC OPTIONS					
To import technology	X	X	X	X	
To produce foreign technology for export and domestic market	X	X	X		
To develop local technology for domestic market	X				
To market locally developed technology overseas	X	X			

Source: Chitty (1987, p215)

The institutional perspective, especially Chitty's strategic freedom model, is most robust in capturing the multitude of institutional and individual behaviors that shape telecommunications development. This model is very good at including the roles of private capital, manpower, and the government in the process of telecommunications

development. Most of all, this model can explain the roles of TNCs in the Third World context with relatively high concreteness. China makes very good use of TNCs in the form of alliances, joint ventures, and foreign direct investment, especially during the process of transferring technology from MDCs. In comparison, the modernization paradigm tries to explain only the behavior of Chinese elite who are adopting and adapting Western technology, assimilating Western values and patterns of action, and importing Western financial, industrial, and educational patterns. China's telecommunications development is explained by its aggressive actions in following the Western model and its focus is given to the government's role of promoting this activity. In the radical paradigm, the behavior of the domestic elite in China is partially explained through their interests in pursuing personal benefits from association with external power. The government's role in China is minimized by the emphasis on the influence of core countries.

According to Mueller (1994), China's economic development was driven by market forces while maintaining its Communist Party monopoly on political power. Its telecommunications development thus proceeded within "a dialectical tension between economic freedom and political authoritarianism, between decentralization and centralization, and between capitalist practice and socialist ideology" (Mueller, 1994, p171). However, once the government's telecommunications planning was set, it has been implemented with the cooperation of newly privatized telecommunications entrepreneurs and assisted by a highly educated and motivated work force, who is

reinforced through market-oriented reform. These "Behavioral Interdictions" in China can be explained better by Chitty's model than the other two paradigms.

China's telecommunications have developed in the context of its own history, including all interactions between economic, political, and social forces. Important factors include: traditional Confucian values regarding hierarchy; the desire for a Communist nation building; and a centuries-long tradition of xenophobia, which was reinforced by a century and a half of mistreatment and subjugation by Western powers; the evolution of the relationship with the United States, Japan and other industrial players; historical policy change from self-reliance to export-oriented economy development; and the central role of the government in development. All of these factors and all of the actors involved in the telecommunications development are closely linked to China's unique history. Only the institutional approach allows a researcher to consider each individual factor that evolved from the history of China.

Chitty clarifies the importance of historical factors in explaining telecommunications development in a specific country. He argues that there are barriers for foreign companies to create a mass market for telecommunications because computer goods, for instance, in a specific country are related to "custom, local conditions, cost, and needs" (p216). He also emphasizes the need for Type A countries, like China, to develop research and development programs in order to examine potential local markets, which are determined by their own history.

The modernization paradigm does not allow for the uniqueness of Chinese history. Its pattern of telecommunications development should not be different from that

of Western nations. The radical paradigm accepts only a part of Chinese history, which is in the net of the world system. Therefore, considerations are limited to describing China's telecommunications development, which took place under the influence of external forces.

China's telecommunications development needs to be explained with non-economic, as well as economic, factors because its path of development is significantly influenced by its Eastern and Communist values. In other words, contrary to the assumptions of the modernization paradigm, China's pattern of telecommunications development is quite different from that of the Western developed countries. Several political and social goals, such as socialist nation building and effective central control, were vital to its telecommunications development. The institutional paradigm explains telecommunications development within the context of China's own institutional framework, including social and political factors. Thus, it allows a researcher to comprehensively describe the roles and effects of these factors on telecommunications development.

The main argument in Chitty's model is that the strategy which is most appropriate to market characteristics brings telecommunications development into a country. The market characteristics embrace all social, economic, political, and psychological factors, such as market size, financial resources, the quality of industrial base, and high-moraled manpower. In contrast, the modernization paradigm performs poorly in this regard because the economy is its basic yardstick, used to measure Chinese society. This perspective, consequently, makes a researcher overlook some important

factors which can not be measured by economic estimation, such as quality of life. The radical paradigm is good at considering noneconomic factors. However, its perspective is overly pessimistic on the possibility of telecommunications development in China and tends to overly simplify the real situation of China's telecommunications.

"Due to its view that the polity of a country must interact with its economy, the institutional approach does not inject political bias in the way that the other two paradigms do" (Taylor and Omura, 1995, p88). According to Chitty, telecommunications development and the diffusion of information technologies are correlated with the processes of overall political-economic development. These two facts reciprocally interact within a context which is not fixed. The model places the strategic freedom variable in a structural system of causality within which the economic and political factors can influence its development. The institutional framework is flexible enough to account for changing dominant forces. For instance, according to Chitty's model, the expansion of the degree of strategic freedom is a process contingent on economic, social, and political variables in the market. The importance of each of these variables changes according to the different historical epochs and different geographical areas. However, the modernization paradigm assumes that China will follow the same pattern as that of Western nations, which did not happen in China. The radical approach implies that the core will always exploit China. However, there were no exploitative Imperialists in China because they were not allowed to enter into Chinese territory, and no relationships were established.

China's telecommunications development took place primarily under the influence of its specific market characteristics, which can not be generalized to the experience of other countries. Contrary to the predictions of both modernization and radical paradigm, China's telecommunications development represents an experience similar to neither the pattern of the Western nor that of any other peripheral nation. The institutional approach, especially Chitty's strategic freedom model, does not command a researcher to universalize what actually took place in China. This model predicts that China's telecommunications development will be unique because development occurs within the context of a country's own institutional framework, including social and political factors.

Only the institutional approach fully describes both internal and external factors. According to Chitty (p217), "in assessing its advantages and disadvantages with a view to developing telecommunications policy, a nation state needs to examine external as well as internal factors. Among the pertinent internal dimensions are education, manpower, industrial base, infrastructure, research and development, local market, and political economy. Among the external dimensions are markets, exporters, investment potential and transborder data flow issues." The modernization paradigm fully considers the role of internal forces but ascribes only a symbolic role to other countries. The radical paradigm focuses more on the negative impact of external forces while overlooking the role of internal factors. However, it is clear that both groups of factors are crucial to telecommunications development in China.

In this chapter, three of the most widely used paradigms in the study of telecommunications and economic development were briefly evaluated by applying them to the Chinese case. All three offer useful but different perspectives and, thus, different interpretations. Each has different analytical advantages and disadvantages in different situations. In China's case, as Exhibit 3 shows, the institutional paradigm, especially Chitty's "Strategic Freedom Model", has higher potential as an aid in analyzing telecommunications development than the other two paradigms.

Exhibit 3. The Explanatory Power Of Three Major Paradigms Of Telecommunications Development

CRITERIA	MODERNI-ZATION PARADIGM	RADICAL PARADIGM	INSTITUTIONAL PARADIGM (CHITTY'S MODEL)
1) Behavioral Interdiction	XX	X	XX
2) Historical Perspective		X	XX
3) Multi-- dimensionality		XX	XX
4) Apoliticalness			XX
5) Nonuniversality			XX
6) Internal and External Forces	X		XX

XX: quite well
X: relatively well

Taylor and Omura's study is proved once more by the results of this evaluation. Their Korean study, which evaluates three alternative paradigms of marketing and economic development in the context of Korea, concludes that the political economy version of institutional paradigm allows for a fuller explanation of Korea's economic

development. This chapter tries to prove the practicality of their criteria as well as their argument on the superiority of institutional paradigm in studying economic development. By using the same criteria, the same paradigms are evaluated in the different fields of study, telecommunications, and in a different country, China. Unlike Taylor and Omura's study, which specifies the paradigms into Rostow's stages of growth approach for the modernization paradigm and the political economy for the institutional paradigm, we focused more on the institutional paradigm while giving it some concretness with Chitty's strategic freedom model.

Chitty's model is useful in answering research questions proposed in this paper. These are the analysises of the development strategy and market characteristics in the context of China's telecommunications industry. In addition, as a version of the institutional paradigm, Chitty's framework reveals the same advantages as the political economy. First, it provides a researcher with a broad and objective point of view to analyze China's telecommunications development, and, thus, its description is rich and close to China's reality. Second, even the areas which are not explained by either modernization or radical paradigms because of their stress on specific factors, are easily explained by Chitty's institutional framework. Finally, Chitty's strategic freedom model has continuity, to be useful once the condition of an economy changes qualitatively. Therefore, Chitty's model is selected to analyze China's telecommunications and economic development in detail. However, before we go further, it is necessary to examine the overall history of policy changes in China's economy, especially in

telecommunications, to understand the background of the current development strategy and market characteristics of China's telecommunications.

ANALYSIS AND ARGUMENT

China's dramatic policy changes in 1979, after Mao's death, resulted in fundamental economic reform and, in particular, telecommunications restructuring. This was an act of survival by changing organizations into those most suited to new economic conditions, as institutional theorists insist. These changes in policy and market characteristics, as a result, greatly expanded the degree of strategic freedom for China. This chapter follows these changes in a historical point of view to analyze the reasons for telecommunications development in China and the roles and interaction of several forces involved in this process.

This chapter will first overview how Mao's death and economic reform in 1979 provided momentum for overall institutional change on several fronts in China, from "Socialist Economy" to "Market Economy", "Self-Reliance" to "Export-Oriented Policy", and "State Monopoly" to "Private Competition". Then, following Chitty's framework, four categories of telecommunications development strategies and four categories of market characteristics, which are recognizable in China's telecommunications development, are analyzed.

Historical Overview Of Policy Changes And Development In China's Telecommunications Industry

China's economic change since 1979 has been a market-oriented reform, even though the purpose of reform was to improve the centrally planned system rather than to replace it with something else. The concept of the market, which had been treated as the embodiment of capitalism and the antithesis of socialism in pre-reform China all along (Hsu, 1991), came to be accepted as not incompatible with socialism (Lin, 1989).

To understand the reason for these shifts, it is necessary to examine China's record of economic performance in the 1950s and 1960s and the problems that Peking's leaders faced when Mao Tse-tung died. Although, in many respects, China's development over the past three decades has been remarkable, the performance of the economy has been erratic, and periods of rapid growth have been interrupted by serious setbacks (Barnett, 1981). Over time, many of Peking's leaders concluded that certain fundamental problems remained unresolved. The pendulum has swung several times between policies emphasizing mass mobilization techniques aimed primarily at achieving Maoist egalitarian goals and more flexible, pragmatic policies designed mainly to accelerate economic growth (Hsu, 1991). Mao himself dominated economic decision making in the late 1950s and again in the late 1960s, during the Great Leap Forward, the Communization program, and the Cultural Revolution. Each of these upsurges of revolutionary mobilization resulted in setbacks to the economy. Mao's views on economic policy had only minority support from the early 1960s on, but they prevailed because of his charismatic power and unique role as Party Chairman (Barnett, 1981).

For many years a majority of the top leaders in China's Party, state, and military bureaucracies, especially its economic planners and administrators, favored a shift toward more flexible, growth-oriented policies (Hsu, 1991). When Mao died and China's leading radicals were purged, the main immediate obstacles to policy change were removed. As changes in China's economic policies began to occur rapidly, Peking's leaders appeared to feel a sense of great urgency about the need to stimulate very rapid growth, as well as to adopt a new approach to economic development (Hsu, 1991).

During 1975-76 the Chinese economy performed very poorly. Agricultural production, including grain output, stagnated in both years (and in the following years as well). Stagnation in agriculture, a major cause of the general economic slowdown, was due in part to bad weather, but the political instability caused by the conflict between China's radicals and pragmatists during Mao's declining years, which intensified as Mao's death approached, also had an extremely adverse effect on the economy (Fewsmith, 1994). Conflict at the top levels of the leadership was accompanied by political strife at the factory level, which resulted in industrial slowdowns and even some factory closures. Low-growth and agricultural stagnation were profoundly disturbing to China's leaders, since the country's population continued to grow by roughly 15 million a year (Fewsmith, 1994).

However, the economic concerns of China's pragmatists in 1977 focused not only on the immediate situation but, to an even greater extent, on the country's inability to solve certain basic, long-term, structural economic problems which, if not resolved, would almost certainly produce slower growth and major economic crises in the future.

These economic difficulties rooted in fundamental problems demanded far-reaching changes in economic development strategy, not merely cosmetic policy changes (Hsu, 1991).

The general economic reform also impacted upon the telecommunications industry. During the 1950s through the 1970s, China's state-owned telecommunications system was considered to be semi-military and highly centralized, as in state-owned enterprises. Telecommunication's function was limited to administrative uses and residential services were available only to those with political privilege, while making telephones a symbol of social status. There was a rare economic or social value given to telecommunications. Whenever the government needed to reduce its budget, telecommunications were usually classified as a non-productive sector and its expenses were cut (Yang, 1991, p4; Lu, 1994, p196). This sector policy resulted in the laggardness of telecommunications during that period. When China launched its economic development program in the late 1970s, the backwardness of China's telecommunications infrastructure was considered as a bottleneck. China recognized the urgent need to expand its telecommunications network, and "the lack of development funds at the state level resulted in the decentralization of decision making and financial responsibilities to the local level" (Lu, 1994, p196).

In 1979, the State Council issued a directive (No 165) to materialize decentralization of its telecommunications operation. The clauses include the separation of government administration and business management in post and telecommunications industries, the separate administration of postal business and telecommunications

business, and the separate accounting and independent financing. Since then, pioneered by Shanghai, 19 provincial administrations have established local posts and telecommunications task forces. They cooperate with the MPT to execute "dual leadership" in the industry (Lu, 1994, p196).

To further specify the directions in Directive No 165, the State Council issued a "six-point instruction code to the post and telecommunications industry" in October 1984 (Jin, 1991, p196). The main idea of this instruction code is to continue decentralization while giving MPT authority over macro-control of the nation-wide telecommunications sector (Lu, 1994, p196). The instruction code can be summarized as follows:

1. The overall planning of industrial development should be unified.
2. Ministerial administration should be coordinated with regional authorities.
3. Responsibilities should be defined and shared among different administrative levels.
4. The construction of infrastructure should mobilize resources from all concerned (source: Jin, 1992, p6; Lu, 1994, p196).

During 1977-78, the shift in Chinese government's attitudes toward economic relations with the outside world were also remarkable. They decided to join the world economically because they recognized that rapid modernization of the kind they envisioned would require expanded trade and increased imports of plants, machinery, equipment, management know-how, and scientific and technical knowledge, especially from the advanced Capitalist nations. This orientation contrasted sharply with that of the

1960s and early 1970s, when self-reliance had been stressed as one of the regime's fundamental principles (Barnett, 1981).

In this chapter, the overall institutional changes of the economy in general and telecommunications industry in particular were overviewed. The economic problems which were aggravated by political conflicts, as well as weather instability, were exposed as Mao, a charismatic ruler, died. The basic economic policy shifted toward a socialistic market economy as China gave up its socialist economy. The self-reliance strategy was replaced by an export-oriented strategy when China launched its new economic policy. China needed to accumulate foreign currency through exports to be able to purchase new technology and equipment from foreign countries. When China embarked on its program of economic reform in the late 1970s, policy makers then became concerned with the backwardness of its telecommunications infrastructure. The lack of development funds and the inefficiency of the state-monopoly resulted in the restructuring of the telecommunications industry.

Analysis Of China's Telecommunications Development Strategy

With this policy shift, China utilized all possible strategies to revive its telecommunications sector. This chapter will analyze the strategies China adopted to develop telecommunications with an objective to assess how effectively the strategies are being implemented. Based on Chitty's model, four categories of the development strategy will be analyzed in the context of China's telecommunications industry. First, importing technology from MNCs includes all forms of technology transfer, such as

equipment purchasing, joint venture, and technician training conditioned in trade contracts. Second, producing or assembling foreign developed technology for exportation and for the domestic market includes all forms of production by any of the domestic manufacturers, joint ventures, or direct investment manufacturers who use foreign technology to produce their goods and/or services. Third, developing technologies for domestic and external markets represent the development of indigenous technologies to reduce technological dependency on foreign countries, while coping with their price increases on technology transfer. The final category of the strategy is marketing locally developed technology overseas. China's activity in the satellite launching market is examined in detail. The regional market is emphasized as an important factor, especially when China tries to sell its products overseas. There are many market indications revealing China as fully exercising all four available strategies.

Importing technologies from MDCs:

According to Sun (1991), China has taken two strategic steps in importing technology from the More Developed Countries (MDCs). In the first step, China purchased a massive amount of telecommunications equipment from Western countries under the condition of accepting loans and technology transfers. However, this strategy turned out to be ineffective in transferring know-how and expertise. So, China took a second step of encouraging joint ventures. As a result of the first step, China saw an upsurge in the purchase of Western technology in the mid-1980s. China's total imports steadily increased during the 1980s, from $20 billion in 1980 to more than $53 billion in

1990 (Asian Development Bank, 1992). The largest exporting regions to China's telecommunications market were Western Europe, North America, and Japan. For example, the dominant sellers of the SPC switches were European and Japanese companies, such as Ericson of Sweden, Alcatel of France, Siemens of Germany, and Fujitsu of Japan (Marketing Department of World Telecommunications, 1991, cited in Warwick, 1994, p296). The huge amount of concessional loans from foreign governments enticed China to choose these companies (Sun, 1991). For China, government loans and technology transfers are the most important conditions in choosing foreign companies. To prove this, the lack of loans and the hesitation of technology transfer make U.S companies under-perform in China, accounting for only five percent of total imports in the telecommunications sector (Sun, 1991). Microwaves, mobile communications, satellites, SPC switches, CPE, transmissions, and other technologies were also imported (See Exhibit 4). Through imports, high technology demand has been conveniently eased and technological gaps with the West have been reduced.

Exhibit 4. China's Telecommunications Imports By Product Categories (1983-90)*

	1983	1984	1985	1986	1987	1988	1989	1990
Microwave	1	1	3	13	2	4	4	1
Mobile Comm.	2	5	8	5	4	2	2	3
Satellite (1)	2	5	4	3	7	2	1	0
SPC Switch (2)	7	9	22	26	24	11	10	8
CPE (3)	1	1	1	1	0	2	1	2
Transmission (4)	1	4	17	20	5	12	8	3
Others (5)	3	8	8	11	6	4	1	2
TOTAL	17	33	63	79	48	37	27	19

Source: China Business Review (1983-91)

*Note: Number of Transactions imports; completed or signed.

(1) Including components and earth stations.

(2) Including PBXs.
(3) Including telephone sets, terminals, etc.
(4) Including coaxial, fiber cables, and other wiring equipment.
(5) Including components, radar systems, and non-voice equipment (data, fax, telex, etc.)

However, transfer of knowledge and expertise did not happen in this strategy. So, the joint venture was adopted as a more desirable approach to technology transfer, hence China's telecommunications industry strongly prefers joint ventures to direct imports (Sun, 1991). The first large-scale telecommunications joint venture was Shanghai Bell Telephone Equipment Manufacturing Company Ltd., established in 1983. Shanghai Bell is jointly owned by the PTIC of MPT (60 percent), ITT's Belgian Bell Telephone Manufacturing Company (30 percent) and the Belgian government fund (10 percent) (Chinese Business Review, 1986). In addition to Shanghai Bell, major joint ventures in manufacturing SPC switches include Germany's Siemens (with Beijing; EWSD), Japan's NEC (with Tianjin; NEAX61), and Canada's Northern Telecom (with Beijing; MSL1). In 1991, there were about a dozen self-financed technology transfer companies, joined with about 100 domestic switch companies (Sun, 1991).

Producing or assembling foreign-developed components/appliances/software:

As a result of the second step of the joint venture strategy in importing technology, the number of joint ventures and direct investments have steadily increased in 1980s, marking 18 joint ventures in 1990, while imports have declined since 1986 (Sun, 1991). Joint ventures and direct investment are very active in the area of satellite

venture, mobile telephone equipment, digital switching system, and fiber optic manufacturing.

During the period from 1988 to 1993, for example, "Cable & Wireless, CITIC and Hutchison took equal shares in the first privately financed PRC satellite venture, Asiasat. Contrad Ltd and other Chinese partners formed a $3 million venture with Beijing Huaxun Telecommunications Technology Company to produce mobile telephone equipment. China Thai International, Singapore Telecom and various PRC interests agreed to launch and operate the Asia Pacific Telecommunications Satellite, the second privately financed PRC satellite venture" (Warwick, 1994, p269). In addition, L.M. Ericson (the Nanjing Radio Factory), Fujitsu Ltd (Nanjing Telecommunications Works), Matsushita Electric Industrial Co (PTIC), and Nokia Telecommunications (Guilin Institute of Optical Communications) established joint-ventures to produce radio-telephone exchanges, fiber optic equipment, pagers, and fiber optic cable respectively. Remarkably, Motorola Inc. established a $120 million fully-owned business in Tianjin to produce semiconductors, paging systems, cellular telephones and other equipment. AT&T and Northern Telecom signed a Memorandum of Understanding with the State Planning Commission for equipment supply (Source: US-China Business Council, Salomon Bros Inc, AT&T archives, cited in Warwick, 1994, p269).

The markets, which had been supplied through imports, were taken up by domestic manufacturers, including joint ventures. China produces or assembles foreign developed components, appliances and software by using its cheap domestic work force. This contributes to reducing import costs and, thus, increasing domestic investment in

technology development, while creating jobs in China. This strategy was remarkably successful in primary technology fields, such as the digital switch, transmission equipment, and CPE. However, highly sophisticated technology, such as fiber optic cable and cellular telephone networks, continue to rely on imports. Nevertheless, considering the current trend, domestic production will probably take the lead (Sun, 1991).

Developing technologies for domestic and external markets:

By using imported technology, China has helped energize its production activity. However, it becomes more difficult to import technology as technology transfer costs continue to increase. To cope with this situation, China changed its strategy to develop indigenous technologies for both domestic and external markets, while decreasing its dependency on foreign technology. China has a strong tradition in basic scientific research. It possesses a considerable number of scientists, engineers, and comprehensive research facilities. The MPT alone, for example, has more than 30 research centers and two universities (Sun, 1991). China began to utilize the existing research facilities for applied uses while cooperating with foreign joint ventures (Sun, 1991).

There are two approaches in applied research. One is to create new products. The high-capacity digital switch DS2000, for example, is a sophisticated product made by the MPT's First Research Institute in 1987. Its quality is comparable to the equivalent imports. The other approach to applied research is to upgrade existing products, such as crossbar and step-by-step switches (Yan, 1989). The emphasis on applied research and

product commercialization has increased production, improved quality, and expanded services.

Marketing locally-developed technologies in overseas markets:

As domestically developed technology has taken the lead in technology from foreign countries, China has launched overseas marketing. According to Gu (1991), in 1985, China founded Great Wall Industrial Corp., the marketing arm of the Ministry of Aeronautics Industry, and started to globally market the satellite launch services on its Long March boosters. Other services, such as the manufacturing of small- and medium-sized satellites, payloads launched aboard recoverable spacecraft, and environmental simulation testing are also included in its overseas marketing. In 1987, the Great Wall Industry Corp. entered into a contract with a U.S. trade service company, Becker and Associates of McLean in Virginia. This U.S. company served as an agent of commercial satellite launch marketing for the U.S., the Middle East, and Latin America on behalf of Great Wall Industry Corp. Two years later, Great Wall Industry Corp. withdrew its contract with Becker and set up its own office in Los Angeles.

In marketing its own technology overseas, Asia-Pacific regional countries become more important in terms of culturally proximate markets for China's expanding economy. The Asia-Pacific region is the fastest growing market in the world. This region began to draw greater attention as the four Asian dragons, such as South Korea, Singapore, Hong Kong, and Taiwan, in the mid 1980s, and ASEAN countries such as Malaysia, and Thailand in the 1990s, recorded high economic growth. As Exhibit 5 shows, The Asia-

Pacific regional market is growing faster than that of Europe and is expected to outgrow Europe in a few years.

Exhibit 5. World Telecommunications Service Market (US$ Billion, %)

REGION	1986	1990	1991	1995	1986-90 (%)	1991-95 (%)
Europe	81.5	136.9	148.4	203.9	13.8	8.3
Latin America	121.9	182.0	195.1	255.1	10.5	6.9
Africa/Middle East	7.7	10.9	11.2	16.2	9.3	9.7
Asia-Pacific	46.1	73.7	82.8	121.4	12.5	10.5
TOTAL	257.2	403.5	437.5	596.6	11.9	8.1

Source: Korea Telecom (1994, p9)

One reason for this fast growth is that the Asia-Pacific region is a huge market composed of more than three billion people. However, most nations in this region have less than four percent telephone penetration. Thus, the potential demand is huge as well. The other reason is that Asia-Pacific countries acknowledge the importance of telecommunications as an engine for economic development and relate their network expansion with the mid- or long-term economic development plans. This policy resulted in a seven percent main line growth, much higher than the five percent world's average. Some of these countries especially tend to build up wireless networks to make up for the weak wired network in a short time. This trend is reflected clearly in Exhibit 6.

Exhibit 6. World Cellular Service Market (US$ Million)

REGION	1991	1992	1993	1994	1995	1997	2000
Eastern Europe	14	65	126	253	407	883	1,810
Latin America	271	560	734	1,029	1,211	1,567	2,547
Africa/Middle East	134	252	305	616	858	1,314	2,037
Asia-Pacific	901	1,541	2,503	2,477	3,096	4,463	7,255
TOTAL	1,320	2,418	3,218	4,375	5,572	8,227	13,649

Source: Korea Telecom (1994, p9)

The importance of regional blocs is increasing in every aspect of technology, finance and culture in the APEC area. Regional communications are already provided by five submarine cables and links with Intelsat and Palapa. Undersea cables link the Philippines, Okinawa, Hong Kong, Singapore, Taiwan and Guam (Hukill, 1991). In addition, to pursue an Asian-centered perspective, Singapore is planning to create a global information highway known as Information Technology 2000. The purpose is that, "by Asianizing the global picture, Asians can look at themselves and their societies through their own 'cultural lenses', and in time, balance the biased presentation of the world by the Western media" (Beng, 1993, p6). It seems likely that China will take advantage of this huge and promising regional market when it markets its locally developed technology overseas.

China's telecommunications have developed largely as a result of its strategy facilitating all of these available capabilities. The basic telephone infrastructure has grown consistently. Total switching capacity approached 29.4 million lines by the end of 1992, from only 4.1 million telephones in 1980. During the same period, telecommunications revenue grew to 35.7 billion RMB (US$ 6.14 billion), representing a

59.4 percent increase, and investment jumped to 38.1 billion RMB (including posts) during the period of 1992 to 1993, a staggering growth of 226 percent (Xu, 1994, p1; Ministry of Posts & Telecommunications, 1994).

In facilitating all four strategies, China obtained benefits from the latecomers' access to dynamic technology without having to invest billions of dollars to develop it on its own (Jussawalla, 1995). The Third World market has generally been viewed as being exploited by industrialized countries. However, in China's case, the advantage has been on both sides. Because of the language barriers and different consumer demand, which only can be determined by research performed within China, foreign investors preferred cooperation with the scientists, technicians, and entrepreneurs who were working within the culture, economic, and environment of Chinese society. China has reaped benefits from this cooperation (Chitty, 1987).

In this chapter, the strategies China adopted to develop its telecommunications industry were analyzed. While taking advantage of its late comers' status, China used its strategic freedom from importing technology to exporting locally developed technology overseas. China's technology base was too weak to support the highly advanced telecommunications industry. Therefore, China embarked on its development strategy by importing technology in the form of equipment purchasing at first and joint-ventures later. In this phase, production was targeted for the domestic market. However, China gradually moved into the second phase of production for foreign markets. While benefiting from its cheap labor, China could sell a massive amount of cheap products overseas. China has acquired a niche market in telephone and computer keypad

manufacturing, even in small- or medium-size satellite manufacturing and launching which is cheaper than that of the industrialized countries.

Along with this strategy, China began to utilize its existing research facilities for commercial use. For example, MPT's First Research Institute has developed technologies equivalent to those imported and achieved success in exporting them overseas. These various strategies, and their successes, have resulted in telecommunications development in China. Telephone penetration has expanded and service revenue has increased. However, it is necessary for researchers to examine what factors made China enjoy this full degree of freedom when it set its strategy. In terms of market characteristics, Chitty's model provides a frame in exploring the factors which affect the process of strategy setting and, as a result, telecommunications development.

Analysis Of China's Telecommunications Market Characteristics

Considering that a country can defend itself with its own tradition, the bigger the market a country has, the stronger the power it can command when it negotiates with Western countries. China's huge market along with several other market characteristics, allows China to become a Type A country. These market characteristics make it possible for China to freely establish its development strategy. At the same time, China's government has strategically developed its market characteristics to expand its strategic freedom.

This chapter will examine China's market characteristics. Based on Chitty's model, four market characteristics will be analyzed. First, the potential volume of the

domestic market will be considered as the most important factor in the development of China's telecommunications policy. The size of the market helps a country to sustain growth even in a case of export constraints. It also provides incentives to develop local technology. Population and disposable income are considered as main indices to illustrate this feature. Second, access to financial resources refers to the ability to tap four different sources: enterprise financing, user financing, government loans, and foreign investment. Abundant financing can support the huge investment needed in importing foreign technology, developing local technology, and marketing locally developed technology overseas. Third, the level of manpower represents the available human resources, such as technicians, engineers, and scientists, as well as researchers and marketers. It is a very important factor, affecting all choices of the strategy. Highly qualified manpower can help to choose quality-technology at a low price, easily learn and use imported technology, develop indigenous technology, and market this technology globally. This part of the chapter will examine the process of changes in China's educational policy, particularly the movement from emphasizing the egalitarian "redness" and toward professionalism. At the same time, officials' integrity and workers' morale are also considered to be important factors, as is the worker productivity. Fourth, relative quality of the industrial and infrastructural base, such as the electronics industry, helps China to easily acquire and apply know-how to its telecommunications sector while promoting synergism between industries.

Potential volume of domestic market

Chitty (1987, p219) argues that "the size of the domestic market is the single most important determinant in the development of telematic industrialization policies." China's huge market size makes it irresistible for foreign countries to invest in and trade with, and therefore, gives China more negotiation power than any other country in the Third World. Before the economic reform in 1979, however, China's market was very weak in terms of income and expenditure, even though its market size was very large in terms of population (a little less than 1 billion). The expenditure in National Material Product in 1978 was only 297 billion yuan out of 407 billion yuan. At that time, the GDP per capita was too low to support the purchase of telecommunications service (considering 5.8 yuan is 1 U.S. dollar, GDP per capita accounts for US$ 73). As to reflect the low purchasing power of the Chinese people in that period, there were 4 million telephones in 1978 covering only 0.4 percent of China and the revenue from telecommunications was only 1.1 billion yuan in 1978 (Ure, 1994, p185; Zhao & Junjia, 1994, p211; Asian Development Bank, 1992, p114).

As GDP increased to 2995 billion yuan in 1993 from 407 billion yuan in 1978, so has the consumers' purchasing power grown. For instance, the expenditure in National Material Product in 1990 increased to 1950 billion yuan from 167 billion yuan in 1978 (Xu, 1994, p 1; Asian Development Bank, 1992, p114). Chinese consumers attained purchasing power that went beyond buying food, clothing and shelter. The number of telephones grew by 481.4% between 1980 and 1995 in spite of an extraordinarily high

installation fee that ranged from 2000 yuan to more than 5000 yuan. In comparison, per capita GDP is 2527.6 yuan in China as of 1993 (Xu, 1994, p9).

According to government plans, the telephone penetration, as a whole, will reach 2.5% in 1995 growing to 5% by the year 2000, and will reach more than 30% by 2020. At that point, China will have reached the level of the world's medium-developed countries, and will have the world's largest telephone network (Zhao & Junjia, 1994, p212; Ministry of Posts and Telecommunications, 1994). China's market at 30% penetration will go beyond the size of the network in any other country. Therefore, the impact of this volume on China's technology innovation and economic development cannot be overlooked. China's domestic market can help sustain growth, especially when exports are constrained for any reason, such as increased competition, a slowdown in world trade, and protectionism.

Access to financial resources

Information equipment and services is an industry requiring huge amounts of capital. However, China lacked development funds due to a long period of devastation caused by war, revolution, economic failure, and misguided reform trials (Sun, 1991). Furthermore, from the 1950s to the 1970s, telecommunications were seen neither as a source of fiscal revenue nor as basic infrastructural prerequisites for socio-economic development in China. Telecommunications were purely a tool to meet administrative needs and symbols of social status. Therefore, priority was not given to telecommunications in allocating financial resources. However, the need to build the

telecommunications network has continued to grow and huge projects have been undertaken as economic reforms proceed, while boosting the telecommunications manufacturing industry. This has increased the need to develop new financial resources both in the service and the manufacturing sectors.

At a national level, as a part of National Information Superhighway (NII), the Eighth Five-year Plan (FYP, 1991-1995) authorized MPT to set up optical-fiber cable links between all major cities. This star pattern network from Beijing to the different regions of China will be supplemented by the transverse links which are established from east to west. With this addition, the entire twenty-two cables will have a length of 32,000 km. On the other hand, the 20 interprovincial digital microwave systems are also being installed, along with a network of 19 communications satellite earth stations. This wireless network is considered to be an effective means which can supply the fast-growing demands while reducing the time and cost spent on cable construction. At a provincial level, the circuit capacity is aimed at 50 million by adding 30 million lines. Consequently, the national telephone density has grown from 1.7 percent in 1993 to about 3 percent in 1995. In addition, a huge submarine cable linkage plan is being implemented in cooperation with Japan and Korea to provide alternative optical fiber gate way facilities to those in Hong Kong (Ure, 1994, p185).

To realize the targets of posts and telecommunications development, it is estimated that about 75 billion yuan will be needed during the Eighth FYP period, according to current estimates (Zhao & Junjia, 1994, p212). Of this, 25 billion yuan is for investment in capital construction and 50 billion for technical transformation. Despite

taking into account service revenue increases to 60 billion yuan and cost decreases through domestic production instead of importing, at least 10 billion yuan is lacking in that period (Ure, 1994, p186; Zhao & Junjia, 1994, p212). The lack of funds at the state level resulted in a decision to decentralize the decision making and financial responsibilities to the local level and to permit foreign investment into the domestic telecommunication sector (Sun, 1991). One important policy, which is adopted by local governments, is called "mobilizing four resources together," namely, enterprise internal financing, user contributions, government fiscal expenditure, and domestic/foreign loans.

The first source of capital is enterprise financing. Revenue from telephone services (including installation) has been the main source for enterprise financing, and it is expected to increase significantly as a result of an expanded user base and an increase of service volume (Sun, 1991).

The second source is user financing. This is being expanded from user premises installations to regional exchanges, such as in new industrial zones. Selling enterprise bonds to the public is also suggested as an alternative for user financing. However, demand for high returns is thought to undermine the performance since the telecommunications industry yields low dividends in the short term (Sun, 1991). The telecommunications entities usually decide to reinvest profits rather than distribute them to the investors, especially in the early stages of development.

The third source is loans. From past experience, local bureaus prefer government loans (converted from budget allocations) to bank loans, because the former has lower interest rates and longer lending periods (Wu, 1990). Since telecommunications requires

long-term investment, loans with low interest rates and longer terms are expected to grow.

Finally, foreign investment is the last and most important, financial source for China. In 1978, China's total annual exports amounted to less than US$ 6 billion (Asian Development Bank, 1992, p115). A tenfold growth of exports by 1990 increased foreign currency as much. However, it was insufficient to continue telecommunications modernization, which would require increased imports of plant, machinery, equipment, management know-how, and scientific and technical knowledge, especially from the advanced countries. Therefore, China gave up its no-debt, self-reliance policy and began to indicate its strong interest in foreign credits and loans. China started to obtain commercial loans by soliciting deposits through foreign banks into the Bank of China. By early 1978, China was negotiating for large-scale syndicated loans from Western and Japanese banking groups and obtained foreign government loans and concessionaire loans from official aid institutions. For example, China applied to one United Nations agency for a loan in that year (Barnett, 1981).

According to statistics, in 1987 loans to China by foreign governments (including mixed loans) totaled US$ 1,339 million, an increase of nearly 70 percent over 1979 (Hsu, 1991). Because of the liquidity of many of the world's money market and the expectation for fast growth, bankers from the economically advanced countries flocked into China with favorable conditions. For instance, the interest on the Japanese Export-Import Bank's $ 2 billion loan was only 6.25 percent for ten years, much lower than the minimum interest rates allowed by the OECD's "gentleman's agreement" regarding loans

to developing countries. It stipulates the minimum rates of interest which should be 7.25 percent for five years and 7.50 percent for loans over five years (Barnett, 1981). These loans have been utilized in key projects relating to energy, transportation and telecommunications in accordance with the state's long-term plan for the development of the national economy (Hsu, 1991).

Considering the decentralization of financial sources, the attractive lending conditions, the amount of foreign investment in China, and the government's strategic emphasis on the telecommunications sector, the problem of access to financial resources seems to be resolved without difficulty. For instance, Exhibit 7 shows that Shanghai's telecommunications investment sources during 1986-90 are diversified (Gao, 1992, p24; Lu, 1994, p197).

Exhibit 7. Shanghai's Telecommunications Investment (1986-90)

Categories	Percentage (%)
Government Fiscal Expenditure	10.6
Telephone Company's Profit	22.4
Users' Installation Fees	27.9
Commercial Users	3.5
Domestic Banks' Loans	13.3
Foreign Investment	22.3

Source: Gao (1992, p24)

However, there is a mounting periodic risk in depending mainly on foreign capital to develop telecommunications. In Brazil, for example, Telebras, the government telecommunications monopoly, achieved success from the 1960s through the early 1980s (Quandt de Oliverira, 1992; Straubhaar, 1995, p9) by facilitating internal savings and

cross-subsidies. Telecommunications services were improved in terms of both quantity and quality. At least one phone was available in every village around the country and in major urban areas, data and business services were effectively provided (Straubhaar, 1995, p9). However, the PTT's entrance into new businesses, such as satellite systems and digital computer networks, aggravated the debt conditions of its overall economy because these new projects were often financed by foreign loans. In the 1980s, the debt began to suffocate Brazil and forced it to privatize its state monopoly, Telebras. Neither new debt nor internal savings, which were drained out in the form of debt service, were available for expansion of both basic and business services (Straubhaar, 1995, p12). That is, foreign loans do not necessarily have negative impacts on the receiving country, but too much debt brings crisis. China has steadily developed its telecommunications industry so far without repeating the failures of Latin America countries. It has actively facilitated internal financing through subsidies from the government and created internal savings by expanding services while wisely controlling foreign debt.

Level of trained manpower

The available manpower, such as technicians, engineers, and scientists, as well as researchers, is an essential requirement for telecommunications development (Chitty, 1987). China had suffered an acute shortage of skilled manpower in many fields, partly because training and research in many scientific and technological fields lagged so far behind in the late 1960s and early 1970s. During that period, China's educational policy stressed egalitarian values and glorified "redness" denigrating expertise and

professionalism (Barnett, 1981). Priority was given to primary and secondary education rather than to higher education and to rural schools rather than to urban schools. Commune-level schools in the countryside were greatly expanded, while institutions of higher education were severely attacked. For many years, all major universities were closed. As a result, the number of students in higher education decreased sharply while aggravating the country's urgent need for skilled manpower. By late 1979 there were just over one million students in 633 regular institutions of higher learning, and only about 19,000 graduate students (Barnett, 1981).

The ideological shift of the economic reform in 1979 has undergridded the new policies adopted in the fields of education, science, and technology and changed attitudes toward intellectuals in general. The above mentioned polices focused entirely on raising the quality of training, especially in higher education, in order to produce effective experts and professionals, particularly in science and technology. They could help meet the manpower requirements and provide the skills needed for the country's modernization programs (Barnett, 1981).

If the present policies to reconstruct an educational system are continued, much of the trained manpower which is needed to develop the telecommunications industry can be supplied. In addition, China's government sends a large number of students abroad. They study science and technology in the industrialized countries such as the United States, Japan, several Western European countries, Canada, and Australia. This number is estimated to reach several hundreds of thousands (Hsu, 1991). Along with these training programs, more and more foreign experts are invited to China in the form of

conferences and joint ventures, which will also help increase the level of skilled manpower in China. However, still less emphasis is given to the importance of marketing and management training in the network and service areas. It is reflected in the poor service quality and ineffective network management in China's telecommunications.

On the other hand, the official's integrity and the workers' morale are considered to be as important as worker productivity. In most developing countries, states have, generally, cooperated with foreign and large domestic capital to promote capital accumulation (Mody & Tsui, 1995). During the process of choosing equipment manufacturers and service providers, the government has actually advanced the interests of big domestic capital as well as its own, leading to spectacularly uneven development and innovation laggardness (Mody & Tsui, 1995).

There are continuing conflicts between ministries and corruption among officials in China. Furthermore, China so far, unlike most other countries, has no communications or telecommunications laws governing the industry (Xu, 1994). This absence of law and strong unified leadership makes corruption easy to be neglected. So, it is urgent for China to set telecommunications laws and to simplify the multi-layered regulating organizations, to lessen internal problems coupled with corruption. Nevertheless, by raising the income level of those at the bottom levels of society, by ensuring the availability of basic essentials to most of the population, by eliminating most conspicuous consumption, and by controlling corruption, China has prevented, relatively well, the kind of polarization of the wealthy elite and the poverty-stricken masses that has

been characteristic of other developing countries. In conclusion, the quality of manpower has increased in China as a result of the educational reform in 1979. This manpower will continue to be a main factor in China's telecommunications development, along with the relatively controlled corruption and high worker morale, which is promoted with the newly given incentives for private property.

Relative quality of industrial and infrastructural base

According to Chitty (1992), countries with some electronics industry, such as satellite, have advantages over those with no industrial experience in developing telecommunications. He argues that "synergies happen when different components of the industry come together in an economy" (p218). In addition to experience in a related industry, regulatory conditions of a country also significantly influence its telecommunications development. The level of deregulation and the efficacy of competition not only provides an incentive for domestic capitals to invest but also decides a country's attractiveness as a target for foreign direct investment. This section will examine how satellite technology and regulatory conditions, as an industrial base, are interrelated with strategy setting in China's telecommunications development.

China's achievement in satellite technology has served as a base in moving towards a new telecommunications industry. China began to experiment with communications satellites in the early 1980s. However, its experience can be traced back to 1978 when China used a Franco-German experimental satellite, Symphonie, to conduct transmission tests for telephone, television, facsimile and time-synchronization, as well as

experimenting with teleconferencing. China's first geosynchronous communications satellite (SWT-1) was launched in 1984, followed by four telecommunications and broadcasting satellites launched in 1986, 1988, and 1990 respectively (Gu, 1991).

According to Gu (1991), China's satellite technology has undergone two phases of development. In the first phase, China used Intelsat's transponders for a series of pilot experiments and demonstrations, and aided the construction of ground networks and the manufacture of equipment. In the second phase, China made and launched communication satellites for themselves. These self-made satellites are now serving telephone, telegraph, facsimile, and VSAT communications of the Ministry of Posts and Telecommunications (MPT) and private satellite communications. Satellite technology for communication has been considered most appropriate for countries that have a vast territory and uneven distribution of population, like China. China has suffered because of its various languages and tribes within its territory, but satellite technology contributes to national unity and cohesion. Nonetheless, there are continuing concerns about the use of satellite technology by China's government for the purpose of central control. Economic and socio-cultural purposes could be achieved by satellite technology, along with "last-mile" facilities, such as local telephone loops, radio links, or rebroadcast transmitters.

Changes in China's telecommunications industrial base seem to embrace deregulation and competition, which is a world-wide trend. China, like other developing countries, has followed a sequential process towards market liberalization. "Typically, the terminal equipment market is opened to competitive supply; then value-added services, satellite-based and wireless services (mobile radio, paging) are liberalized; and

finally, the market for basic switched services is opened to competition, starting with inter-exchange services" (Smith & Staple, 1994, p16). Such a progression is accompanied with the new regulation and PTT reform in China. The following section will examine the trends of China's telecommunications restructuring, such as competition in service, competition in equipment manufacturing, deregulation and privatization, and reform of MPT.

Competition in Service

When the Ji Tong Communication Corporation formally registered as a company in June 1993, a new era of competition was opened in China's telecommunications industry. Against MPT's monopoly, the Ministry of Electronic Industries (MEI) founded Ji Tong with 30 other state-owned enterprises and research institutes in Beijing, Guangzhou, Shanghai and Shenzhen. Several ministries and the State Council's investment arm, Chinese International Trust and Investment Corporation (CITIC), are also participating in this alliance. Ji Tong, in return, is a stakeholder in the Lian Tong along with the Ministry of Railways (MOR) and Ministry of Energy Resources (MOE). Lian Tong is another competitor poised to enter the long-distance telecommunications field (Ure, 1994, p182).

Ji Tong's plan includes to set up "joint ventures with overseas companies in communications research and product development, the building of local trunked radio, paging, cellular and CT2 network, and the running of public data and value-added network services in China" (Ure, 1994, p182). However, it will start its business by

utilizing more than 30 private networks already operated by about 20 different ministries. Most of its service will be based on radio and VSAT, while being supplemented by cable trunk. On the other hand, Lian Tong's plan includes building and operating long-distance cable with local interconnects in order to supplement or to compete with the MPT in voice traffic. As an alliance of ministries, Lian Tong is potentially well positioned to utilize the optical fiber cabling of the MOR's railway and other ministries (Ure, 1994, p182).

The capacity of these private networks owned by many different ministries is almost equivalent to that of the public network run by the MPT. Among the 32 million lines of China's total capacity, 19.26 million were for public use and 12.74 million for private or specialized use, constituting 40 % of China's total (China Business Weekly, 1993). Specifically, "the MOR owns 35,000 km of open-air lines, 30,000 km of coaxial cable, and 3,000 km of optical fiber cable. Aside from these cable facilities, the MOR has set up numerous microwave links and 400,000 lines of switching capacity." Likewise, the MOE owns 27,000 km of digital microwave links. All of these private networks have spare capacity which could be available to the public (Chang, 1994, p207). There are other domestic interests that want to break into the lucrative telecommunications business. They include other ministries with private networks and state organizations at the central and provincial levels, such as the People's Liberation Army (PLA), which controls radio frequencies. Privately trunked radio networks, paging networks and mobile cellular telephone networks have all offered opportunities for these state organizations to tap into public demand for telecommunications (Lu, 1994, Tan,

1994, Chang, 1994). In Shanghai, for example, "there are now 92 private networks run by different branches of the local authorities, of which 83 are wireless and nine are cable networks. There are 125 networks run by various ministerial administrations" (Lu, 1994). In China, this competition in the service area seems to naturally grow in the markets rather than being artificially planted by government, as is the case in other Asian countries. This situation is similar to the growth of Competitive Access Providers (CAP) in the United States.

In the past, commercial use of these private networks was prevented by MPT, except for their owners' own business. However, since the decisive power was handed over to local authority, the private networks have been permitted by Provincial Telecommunications Bureaux (PTBs) to provide wireless services to consumers. For example, more than 20 paging service providers are under contract with local telephone companies in the form of joint ventures. The major competitors include fire stations, military units, the Bureau of Meteorology and the Bureau of Seismology, which already have licenses to develop their own spectrum to use (Lu, 1994, p199). As a result of competition, according to Lu, rates exorbitantly decreased and pager users quickly expanded. Statistics show that there were 156,000 radio pagers in Shanghai by the end of 1992, up from 6900 in 1987. Furthermore, most of the distinctions and discriminations between private and public access disappeared where interconnect arrangements had been struck at the local level with the PTBs. This removal of technical and operational obstacles increased convenience for users.

This trend towards expanding competition in service markets seems likely to be continuing. According to a Shanghai PTB officer, "future reforms will aim to build a regulatory framework under which all terminal services are deregulated and liberalized while the basic network of telephone and telegraph remains monopolized by the government. Value-added services (data processing and transmission, mobile telephone services and so on) will be regulated as monopolistic competition under government monitoring" (Lu, 1994, p199). In some Chinese cities, cable TV has been supplied by private providers (Liu, 1994).

This growing competition in the telecommunication industry has caused many arguments supporting the view that the basic communications network should be subject to an unified management and operation by a single authority, such as MPT. Those issues can be summarized into the following matters: economies of scale, which are mentioned by many economists to be a main feature of telecommunications industry; an integrated network with unified technologies and service standards; cream skimming and universal service obligation subject to cross-subsidy; national sovereignty and security; and advantage of monopoly in promoting rapid growth. However, in the context of China, the theory of economies of scale is paled in comparison to the issue of labor production, service quality and the reasonable utilization of existing resources of private networks. The issue of an integrated network which has been used by MPT as an excuse to maintain its monopoly status is also challenged by competitors. Like international communications, multiple service providers can embody all of the features of an integrated network without detracting from interoperability. With regard to cream-

skimming and universal service, MPT and PTBs are given a priority in planning and managing networks while private networks are allowed to provide a complementary service rather than direct competition in profitable businesses. For example, the services in the regions which are not covered by the public network but are covered by the private network are expected to be beneficial. The utilization of the private network is more focused on the development of remote border provinces and rural communications. The issue of national communication sovereignty could be solved by using encryption technology and by limiting the management of telecommunications services to Chinese nationals, not by maintaining the state monopoly. The benefit of monopoly in rapid growth is also challenged by competitors because it lacks empirical examples. They argue that since 1984, the year of AT&T divestiture in the USA, a growing number of countries are utilizing competition to facilitate the rapid growth of telecommunications (Chang, 1994).

One more thing to consider regarding service competition is the separation of the telecommunications sector, which is technology and capital intensive, from the posts, which is labor intensive. In a competitive environment, it is imperative to separate posts from telecommunications because the posts sector is now heavily subsidized by the telecommunications sector. "In 1990 telecommunications subsidized posts by US$ 120 million, and in 1992 the figure increased to US$ 260 million, 7% of total telecommunications revenue in the same year" (Xu, 1994, p9). With this measure, the telecommunications sector can utilize all of its capacity for its own development, without

diverting its profits to another sector, while increasing its competitiveness in the global telecommunication markets.

Even in this expanding competition for telecommunications service, foreigners are almost completely closed out from participating in telecommunications service provision. The MPT has successfully prevented foreigners from network ownership and involvement in service operations, so far. Even the only joint venture, Shenda, as an example, was bought back from Cable & Wireless. AT&T, NTT, BT and Cable & Wireless have also unsuccessfully tried to penetrate China's public networks (Tan, 1994). However, further economic reform and development will result in increased demand for advanced and value-added services, which urgently calls for technological and management expertise from foreign operators.

Competition in Equipment Manufacturing

Unlike the service market, the equipment sector has been developed through competition between two major telecommunications manufacturers, MPT and MEI. Interestingly enough, MEI has 106 factories producing electronic components, computers and telecommunications systems, surpassing MPT which has 29 factories. In terms of the quality of research base, MEI also precedes MPT. The huge amount of research grants and orders from the traditional private networks make MEI more advanced in R&D capacities and manufacturing facilities than MPT. For example, MEI had already begun to supply digital microwave systems when MPT was struggling with its analog systems, in the early 1980s (Tan, 1994, p179).

Since the economic reform in 1979, however, the MEI's market share in telecommunications equipment has been eroded by foreign manufacturers, as well as new domestic competitors. While its entrance into a newly growing telecommunications market is being blocked, due to MPT's strong link with its manufacturing subsidiaries, MEI's traditional customers, such as the military, Ministry of Energy and other large organizational users, turn to international suppliers for new and advanced equipment and technologies. The military budget reductions in R&D also cut off the MEI's R&D edge. To cover this loss, MEI formed alliances with other private networks and tried to enter the service market (Tan, 1994, p179).

Allured by China's large, growing market, ambitious telecommunications development plans, and rapid growth rates, which are the characteristics of growing economy, almost all major international equipment manufacturers, such as Philips, Alcatel, AT&T, Northern Telecom, and Motorola, have set up representative offices in Beijing. They are involved in every aspect of supplying telecommunications technologies, from switching systems, transmission equipment and terminals, to components and materials. Some of them directly sell their products and transfer technology and know-how. Others have set up joint ventures or fully-owned manufacturing ventures. Most of the areas with manufacturing components contain provisions regarding technology transfer, joint R&D and training of Chinese nationals (Tan, 1994, p180; Warwick, 1994, p267).

Deregulation and privatization

In China, the principle of separation of business management from government administration was implemented by the Directive No165 in 1979 and reaffirmed by the following directives in 1984 and 1994 (Lu, 1994, p197; Jin, 1991; Xu, 1994). The State Council endowed the MPT with "the *de facto* responsibility for the planning, development and management of the national public telecommunications network in China" (Ure, 1994, p184). The corporatization was the central philosophy of economic reform and the Open Door Policy in 1979 (Xu, 1994). In further reforms, the PTBs could retain considerable financial autonomy under the MPT's general control. This financial independence allows PTBs to have flexibility in planning (Sun., 1991). Before the reform, for example, even a network plan in a small village had to be set up centrally, where decisions were made only when government officials, state enterprises and Party cadre were together (Ure, 1994).

Under the Seventh FYP (1986-1990), the PTBs' decision-making power was further strengthened to strike their own commercial deals. PTBs' financial freedom also expanded as taxation rates reduced to 10% from the usual 33% levied on state enterprises. However, many restrictions imposed by MPT still remain, for example, the approval of contracts with foreign equipment suppliers and foreign exchange transactions (Ure, 1994, p184). A new MPT structure was approved by State Council in February 1994 and took effect in March 1994 under State Council Directive No. 24. This directive includes an important clause related to privatization. Directorate-General of Telecommunications (DGT), China's national network operator responsible for international network, national

Class 1 and Class 2 networks, technical operation and maintenance, is separated from MPT. With this measure, DGT becomes an "enterprise department or a quasi-public enterprise with autonomy in their independent accounting and network operation. DGT is empowered to manage, operate and build a nation-wide public telecommunications network and provide basic services with the obligation of providing universal services" (Xu, 1994, p5).

DGT's functions become similar to AT&T in the U.S. However, China's privatization does not reach the meaning and degree of the United States or other Asian countries. In most areas, the PTB still retains a combined form of a government department and a business organization. At the city and county level, the PTBs have neither the status of a legal person nor a business licensee. According to Lu (1994), "all the telephone companies above or at a township level continue to be owned and run by the state. Companies at county and township level are owned and run by the local governments. Exchanges at a village level are collectively owned by peasants. Long-distance service revenues are redistributed nationally" (p197). Therefore the local companies' capital investment and the pricing of services are controlled by the government. The government decides quotas for foreign exchange credits and allocates government loans by following its plans. "The ministry set a price cap according to the local telephone company's average costs plus a mark-up for profits. Local telecommunications companies can set their own intra-city rates within the cap, subject to the approval of the local government's price control authorities" (Lu, 1994, pp. 197-198).

The privatization of telecommunications in China means delegation of power to local governments rather than selling government-owned corporations to the private sector. Local governments are allowed to have partial decision making power in financing, investment and operation while MPT's authority is not reduced in national service and general management. This two-level monopoly system has been envisioned by the government since the beginning of the reform, keeping in mind the difficulties of central control. The physical and psychological distance between the MPT in Beijing and the PTBs in the provinces have interrupted the effectiveness of management in the telecommunications industry. The PTBs' daily work has been more closely coordinated with provincial governments and provincial-level interest groups, however, their formal procedures of work have to go through the bureaucracy of the MPT at cost of time and efficiency (Ure, 1994, p188).

In short, the monopoly of the MPT has been forced to give way to competition, since MPT has been unable to meet strong demand for basic phone service, as well as business quality service. MPT also had problems with national control over telecommunications policy, planning, and financing due to the national multilayered structure. Its rigid administrative bureaucracy was slow to respond to market demand and competition. On the other hand, PTBs have been empowered to enter joint ventures with non-PTB bodies which can be domestic or foreign. The Chinese government has supported these trends by issuing several directives to deregulate the industry (No 165) and to guarantee fair competition (No 54).

Reform of MPT

As a measure to reform telecommunications, the Chinese government separated telecommunications regulation from the service operation. PTT's restructuring is a world trend, as shown in the EC's Green Paper in 1987 and several other announcements from Asia and Latin America in late 1980s. This has been criticized as a surrender to the TNCs' global expansion tactics and their pressure to liberalize the telecommunications industry in the Third World. However, In China the issue was not raised by external powers but as a result of voluntary domestic reforms. Since economic reform in 1979, most Chinese industries, including telecommunications, have experienced separation of government controls from enterprise management. These ministry-owned and operated enterprises and factories have been registered as independent companies. However, several ministries are excluded from this measure, due to military purposes and their perceived importance for national economy. The MPT was categorized as semi-military, therefore, its restructuring has been partial. While keeping its basic service facilities in the ministry, the MPT was required to streamline its organizational structure and to separate its business management from its regulatory function (Xu, 1994, Tan, 1994).

Facing bureaucratic rivalries and market pressures toward service liberalization, the State Council made some policy changes in 1993 with regard to the telecommunications sector. The objectives of the current MPT restructuring are "to strengthen the macro- control of the nation-wide telecommunications sector, improve the sectoral planning, coordination, service provision and monitoring; upgrade and improve a national public switching telecommunications network (PSTN); ensure the integrity

and technological advancement of the PSTN; separate distinct roles of government and enterprises, streamline bureaucracy and increase efficiency based on the principles of functional separation, relationship clarity, streamlining, integrity and efficiency" (Xu, 1994, p5). The restructuring was a result of MPT's focus shift, "from micro-to macro-control of the telecommunications sector and from public network management and regulation to nation-wide and sectoral regulation and policy formation" (Xu, 1994, p5).

In this chapter, China's market characteristics are analyzed based on Chitty's model. The ascending level of market characteristics in all four categories help China freely establish its development strategies. The potential size of the market has expanded as the huge population of China attains more purchasing power. The size of the market has helped China to sustain growth, even in a case of export constraints, and has provided incentives for developing local technology. Access to financial resources has been eased and diversified as China's government has adopted a policy to mobilize four resources together; these are government loans, user contributions, enterprise internal finance and foreign loans. The abundant finance options have supported the huge investment needed in importing technology, developing local technology and marketing locally developed technology. The level of manpower has increased, as the educational reform emphasizes the importance of professionalism. The morale of workers and integrity of officials have been retained, since the Communist ideology supports the equity of workers and helps to prevent corruption. The increased level of manpower altogether has aided the rapid growth of China's telecommunications. The quality of the industrial base in the satellite market has created synergies for other telecommunications sectors to enter the business

and try to develop related technologies. The restructuring in the telecommunications industry, such as privatization, competition, and reform of MPT, has also provided a better quality of industrial base when China establishes its development strategy and negotiates with foreign companies to attract foreign investment.

The driving force in these policy changes is that China has recognized the strategic importance of telecommunications in national economic development and that it is determined to utilize all available domestic resources for network growth (Ure, 1994). The following chapter will examine the role of telecommunications in economic development. It is important to examine how telecommunications can contribute to economic development and how telecommunications' contribution to the economy can be evaluated. This examination helps policy-makers in acquiring confidence when they set strategies and provides a set of criteria when they appreciate the results of the implementation of their strategy.

Analysis Of Telecommunications Impact On Economic Development In China

Telecommunications are now widely considered to be strategic investments for a nation which tries to maintain and improve its competitive advantage. The approach to the study of the social and economic impact of telecommunications started in the late 1960s. Most of the studies developed within this approach were performed to support national planning and investment decisions in telecommunications within developing countries. The objective was to demonstrate and quantitatively estimate the economic value of telecommunications investment (Saunders, Warford, and Wellenius, 1983). The

argument underlying these studies can be summarized as follows: "investment in telecommunications contributes to economic growth; the indirect benefits of telecommunications generally greatly exceed the revenues generated by the telecommunications network; the availability of telecommunications can contribute significantly to rural economic activities; and the use of telecommunications can improve the quality and accessibility of education, health care, and other social services" (Wellenius & Stern, 1994, p36).

Boosted by economic reform and opening process in China, the demand for telecommunications services has increased and the investment of its infrastructure has been stimulated. As a result of this, China's telecommunications industry has grown fast, exceeding the growth of the GNP and foreign trade, as Exhibit 8 shows. During the decade between 1981 and 1991, the average annual growth rate of telecommunications was 20.9% while that of GNP and trade was 8.8% and 12.2% respectively. Furthermore, in 1991 and 1992, the telecommunications growth rate exceeded 40% marking 71.6% during the first four months of 1993 (Whang, 1991; Zhao & Junjia, 1994, p214). The growth of the telecommunications industry is higher than that of China's economy as a whole, while proving "the social benefit of the communications infrastructure is much higher than the direct benefit received by the posts and telecommunications authority itself" (Zhao & Junjia, 1994, p214). Telecommunications not only facilitates communication but also "reduces the time and space consumed in the process of production, distribution, exchange, and consumption, thereby saving energy, labor and capital" (Zhao and Liu, 1994, p214)

Exhibit 8. Growth Rates In GNP, Trade And Telecommunications

	1978	1980	1985	1990	1991	1992
GNP	3,588	4,470	6,558	17,695	19,855	24,000
		(25)	(47)	(170)	(12)	(21)
Trade	260	381	696	1,154	1,357	1,656
		(85)	(83)	(66)	(18)	(22)
Telecommunications	11	13	30	82	204	286
		(18)	(131)	(173)	(149)	(40)

Source: Ministry of Posts and Telecommunications (1994).
Unit: 100 million yuan. Figure in brackets are percentage changes.
Trade = import value + export value

To pursue more accuracy in quantifying the social benefit of posts and telecommunications activity, Chinese experts have examined the macroeconomics contribution of posts and telecommunications input to the total growth of the national economy. Luo (1989), for instance, calculated the effect of telecommunications investment on the national economy by using a mathematical model. The results of the calculation show that an additional investment of 100 million yuan in the post and telecommunications industry will increase national income by 1.38 billion yuan after 10 years. The benefit ratio is thus approximately 1:14 where the internal rate of return is 45 percent (Zhao & Junjia, 1994, p214). This rate of return in telecommunications is well above the 10 to 14 percent threshold return which is used to screen public sector investments in general. In addition, the results of many research projects performed in various countries all reflect this fact. For example, research in the former USSR has reported that the direct benefits account for only 5 to 10 percent of the total benefits of the communications undertaking (Whang, 1991, Zhao & Junjia, 1994, p214). In short,

the investment in telecommunications makes a strong contribution to the overall economic growth of China.

Based on this idea, China's government has established strategies to develop telecommunications within the domestic economy and to use it as the lead sector for export strategies. While consistently increasing investment in telecommunication, China expanded its telecommunications infrastructure. Compared to 1992, telephone mainlines reached 17.3 million in 1993, 5.8 million lines more or a 50.4 percent growth; total switching capacity approached 29.4 million lines, 10.2 million more or a 53.1 percent increase (Xu, 1994, p1; Ministry of Posts & Telecommunications, 1994).

Despite the sustained and rapid growth of telecommunications, the network capabilities, however, continue to lag far behind the social demand. China has not reached the minimum rate of telephone penetration, which ITU decides according to the average per capita income of a country. China achieved only 1.63 percent telephone penetration whereas ITU suggests that of more than 3 per 100. Furthermore, the completion rate is very low because the technical and financial resources cannot support the increase in telephone line use. Completion rate for long-distance circuits in the south and central China is only about 15 percent while that for local calls is about 60 percent. The waiting time for telephone service in the cities is usually around 18 months, but can sometimes be delayed up to two years. Waiting lists continue to remain at over the 1.6 million mark, indicating a substantial need to increase telephone networks. Among the waiting lists, 60-90 percents are residential households showing the potential of market growth (Zhao & Junjia, 1994, p212). The difference between demand and supply has

exposed many problems which China's telecommunications operational and structural deficiencies cause. China's path to telecommunications development has not always been easy because of the following limits:

Investment Capital. The level of investment has consistently been much lower than that needed to meet demand. Although overall telecommunications investment in China grew in the last 4 years at 69.5 percent per annum, to US$ 5.51 billion in 1993 from US$ 1.20 billion in 1990 (Xu, 1994, Table 1), China's telecommunications development still lacks investment. Total posts and telecommunications investment as a proportion of GNP was 0.43 percent in 1986-90 and 0.54 percent in 1991-92 (Xu, 1994, Table 1) while that of the newly industrialized countries in Asia has usually been more than 1.5 percent of GNP. China's telecommunications are required to increase investment up to that level if it is to keep its economy booming, and finally, leapfrog other countries' development. Underinvestment is caused by many reasons: general shortage of domestic capital and foreign currency in the pubic sector, competition between sectors demanding government grants, allocation of telecommunications operating surpluses to other public sectors, limited or no access to other sources of capital, investment ceilings to contain sector spending and achieve broader macroeconomic objectives such as keeping inflation and foreign debt down (Wellenius & Stern, 1994).

Organization and Management. China's telecommunications operating entities have been considered to be parts of government administration for a long time. Therefore, the organization and management is not established in ways that are

appropriate for running a high-technology-based commercial service in a rapidly changing business environment. The organization is inadequately structured, finances are inefficiently managed, accounting and information systems are not suited for business, and personnel development is not inspired (Wellenius & Stern, 1994). These problems have caused high operational and expansion costs. Poor maintenance and slow responses to changing demands and business opportunities have also resulted from these weaknesses. The preparation and implementation of development programs are mainly disturbed by these limitations. In short, these drawbacks in organization and management have constrained the expansion and improvement of China's telecommunications (Wellenius & Stern, 1994).

The bureaucracy within China's post and telecommunications organizations has caused significant inefficiencies like those of other state-owned monopolies. There are many extra administrative entities which are unnecessary in operating business. The structure of management is very complicated and poorly designed. For instance, in the Beijing Telecomm Administration, "there are 28 executive sections, five departments that handle Communist Party affairs, six departments in charge of labor union affairs, and more than 10 research institutions, trade societies and associations" (Lu, 1994, p196). The coordination between these different administrative entities is very difficult because decision-making power and responsibilities are not well defined. Therefore, many meetings are necessary and the decision making process is very slow (Lu, 1994, p196).

Sector policies. Because of the status of a regulated monopoly, the freedom and the incentives to perform as an efficient business are not enjoyed by the

telecommunications operators in China. Inadequate policies by China's government regarding the telecommunications sector have caused many problems, such as the lack of capital and poor enterprise performance. China's telecommunications operating entities have not been allowed sufficient financial and administrative autonomy because of the government's emphasis on the national security and social welfare. Tariffs do not reflect the entity's financial requirement and cost structure and there is little incentive to reduce costs and improve service quality. Furthermore, the freedom to access other sources of capital, which is needed to expand services and innovate technologies, is not allowed. The morale of workers in telecommunications sector is depressed partly because of noncompetitive salaries and partly because of insufficient career opportunities for staff and managers (Wellenius & Stern, 1994).

For instance, Directorate-General of Telecommunications (DGT) in China , which is responsible for the National Public Switched Telephone Network (PSTN), has a very negative reputation among most Chinese customers due to its poor service, low quality, delayed servicing and maintenance and rude attitudes of some P & T staff towards ordinary customers. All of these problems are due to DGT still being under MPT. DGT is acting like a government enterprise even after its partial separation from MPT (Xu, 1994).

In this chapter, we examined telecommunications' contribution to China's economic development. Telecommunications facilitates economic development in three ways: by improving efficiency, efficacy, and equity. This argument has been proved by many researchers. Most of all, the calculation of benefit ratio provides clear evidence of

telecommunications' value for investment. Based on this idea, China's government has increased its investment in the telecommunications sector. However, in spite of the substantial growth of investment and construction, the demand for telecommunications service has not been satisfied because of such limitations as inefficient organization and management in telecommunications entities, underinvestment of capital in the telecommunications industry, and misguided sectoral policy.

However, these issues are not limited to the basic telephone industry but reach to the field of advanced technology such as digital computer networks, which are emerging in the forefront of interests, and cable television, which is growing quickly marking 1,110,000 subscribers in 1990 from 70,000 in 1983. Specifically, the digital network project confronts a number of significant obstacles, such as MPT's strict control (forcing everyone else to connect only through its routes while preventing any development of alternatives); institutional rivalries and distrust when every related institution wants to host a computer network center; US restrictions on technology exports to China with concerns about possible military use of exported technology; the lack of the telecommunications act and the authority which can effectively administer it; bureaucracy and the lack of independence from the power structure; and the lack of privacy protection measures in telecommunications operations (Zheng, 1994, p240). On the other hand, the cable industry has to solve those problems concerning advertising, reception and distribution of international satellite signals, competition with over-the-air broadcasters, over building and program censorship, as well as the direct conflict between the political objectives of the central government and the commercial imperatives driving

cable development at the local and provincial levels (Liu, 1994). If these problems are successfully solved, the goal of telecommunications development in China will be achieved without difficulties, while taking advantage of its favorable market characteristics and strategic freedom.

SUMMARY AND LIMITATIONS

This China case study has been carried out using Chitty's "Strategic Freedom Model," which was chosen through an evaluation process. This model allows a rich description, as well as a reality-matched explanation, on the China's telecommunications development. Most of all, this framework is appropriate to answer the questions raised in this research: (1) What development strategies has China adopted in telecommunications development? (2) What kinds of relationships exist between telecommunications development and the institutional arrangements in China? (3) What is the impact of telecommunications on the economic development in China?

China has adopted four strategies, at the same time, to achieve a goal of telecommunications development in a short time: importing technology from the MNCs; production of imported technology for exports and domestic markets; development of local technology for domestic markets; and marketing locally developed technology overseas. China has taken advantage of the benefits of late comers in gaining access to dynamic technology without having to invest billions of dollars to develop its own when it proceeds its development strategy. This full degree of strategic freedom which China now enjoys has been possible because it has market characteristics, such as a huge potential volume of the domestic market, easy access to substantial financial resources, relatively good quality of industrial and infrastructural base, and a high level of manpower, even though its market is not as mature as that of developed countries.

Despite its remarkable ability to explain China's telecommunications development with the concepts of strategic freedom and market characteristics, Chitty's model has limitations. This model wrongly equates strategic freedom directly with development. It is true that the degree of strategic freedom is determined by market characteristics and it may affect the telecommunications development, as the model shows. However, Chitty neglects the fact that it depends on the strategic choice of government whether or not those strategies are adopted and executed. That is, what really matters in China's telecommunications development has been the strategic choice of government, it becomes clear during the process of analyzing China's telecommunications development. As the pendulum swung from the Maoist egalitarian goals to the pragmatic goal of economic growth, the development strategy of telecommunications was fundamentally changed, causing a shift of market characteristics.

Before the economic reform in 1979, China pursued a goal of socialistic nation building and self-reliance economy. To achieve this goal, the Chinese government limited its strategy only to the development of local technology for the domestic market without considering trade relationships with the outside world. This was possible because China's government and its charismatic ruler had discretionary power over market power. That is, during that period, China denied its strategic freedom by choice and this strategy resulted in a failure in telecommunications development. China's vast telecommunications market could not be easily satisfied with domestic production and the development of its own technology was slow and uneconomical. For instance,

although China made the first digital computer in 1958, and began research on fiber optics as early as 1971, most results failed to become viable products (Sun, 1991). During this period, demand was suppressed, industrial infrastructure lagged behind agriculture, and expertise was negated.

While admitting this strategic failure, China embarked on the economic reform in 1979. The general reform had an impact on telecommunications: decision making power was decentralized; the state owned telecommunications monopoly was gradually privatized; and foreign investment was allowed within limitations. At the same time, the market has been developed towards supporting this process of telecommunications development in the following areas: the potential size of the market has been enlarged in terms of purchasing power for telecommunication services; financial resources have been developed to construct telecommunications infrastructure through mobilizing four resources, namely, enterprise financing, user financing, government loans, and foreign investment; and the level of manpower has been raised through educational reform. As the attitudes toward intellectuals in general have changed, the quality of training in higher education has been emphasized and the morale of people has been heightened as well. The quality of the industrial and infrastructural bases have been improved as the electronics industry flourishes and the regulatory environment has been changed in favor of liberalization and competition.

This paper is based on Chitty's strategic freedom model but attempts to overcome its limitation by demonstrating the importance of government's strategic choice in China's telecommunications development. Chitty's model is an appropriate framework

in explaining China's telecommunications policies. However, this model lacks an explanation of the strategic choice of the government, which had been a very critical factor in China's telecommunications development. This finding suggests that researchers and policy-makers in a specific telecommunications markets should examine the state's approach to developing its telecommunications: the economic system; the basic perception of the market and property; the degree of centralization of state power; the choice of role model to follow; the decision of economic policy either to substitute imports or to focus on exports; the attitude towards the private sector and foreign investors; the philosophy on telecommunications in general whether it is a tool for military and administration or a booster of the economy; and the ideology of telecommunications policy whether to pursue the freedom of speech or a concept of public property. Especially in China where the political system still remains as a strong decision maker even though the economic variable gains weight, it is necessary for researchers to focus more on the political factors. Drawing from Katz (1977), China can be said to be now in the second developmental stage:

> In the first stage of political development -state-building- it is the political variable that closely controls the diffusion process. In the second developmental stage, the economic variable gains weight, and information technologies are needed as part of each country's infrastructure for supporting economic growth. Yet, still at this stage, political system may act as a constraint on the satisfaction of information needs emerging from the economy, by means of the regulatory process, or as an impetus for diffusion by means of industrial policy. In the third developmental stage-maturity- two parallel process challenge the hegemony of the political variable. The importance of the political variable decreases and the relevance of economic factors in determining diffusion of information technologies increases (Katz, 1977, p64-65).

Politically, China is one of the strongest nation states, which still maintains a Communist Party monopoly in political power. However, economically, China has much stronger market characteristics than the former USSR. Therefore, the conflicts between political and economic variables have been stronger in China than in most other countries in the world. "Its development is thus driven by a heated dialectical tension between economic freedom and political authoritarianism, between decentralization and centralization, between capitalist practice and socialist ideology (Mueller, 1994, p171). As a natural result of these conflicts unique to China, its pattern of telecommunications development is unlike that of other developing countries. These countries have taken top-down manner in telecommunications reform and used the state-owned PTT as an instrument of policy. On the contrary, the shifts of China's telecommunications environment have been driven by forces outside the MPT. These forces have tried to introduce a more liberal telecommunications policy which can allow effective competition. "There are also internal centrifugal forces which are making it difficult for the MPT to maintain its exclusive power on the sector" (Tan, 1994, p174). In this respect, the progress of China's telecommunications development can be said to resemble the liberalization occurring in the United States.

This growing competition in China's telecommunication industry raises the same questions which Western researchers are struggling with. These issues are related to the concepts dominating the philosophy of telecommunications regulation. They include economies of scale, an integrated network, cream skimming and universal service, national sovereignty and security, and advantage of a monopoly in promoting rapid

growth. In the context of China, these issues are effectively faced by supporters of competition in terms of the benefits of competition and the changes of technology which reduce the importance of scales in economy. They believe that technology can provide solutions to most problems in telecommunications and try to find evidence in the Western countries which successfully restructured their telecommunications.

Finally, China's telecommunications development has been driven by foreign technology and investment while its sovereignty and autonomy are ferociously protected by the Chinese government. This policy of market protection can be traced to China's centuries-long tradition of xenophobia, as well as the government's conclusion that China's market is still too vulnerable to directly compete with Western countries. "China's authoritarian politics, human rights abuses and potential military power inevitably attract criticism and sanctions from the West led by the U.S. At the same time, however, its growing affluence, market size, and cheap labor make it a virtually irresistible target for investment and trade. The outside world is simultaneously seduced and repelled" (Mueller, 1994, p171). The emergence of China as a nation-state and as an economic power depends largely on the operation of these contradictions between economy and politics, between market and strategy, and between dependency and autonomy.

CONCLUSION

This research reveals again that there is no generalization in economic development because each country not only has its own market characteristics and different degree of strategic freedom but also utilizes the freedom in its own way. What is most important for a country which is pursuing telecommunications development is that it should make a precise analysis of its own market, to understand its present and potential market characteristics and decide its strategic options most appropriate to its market. In the same context, China's current, and future, success in telecommunications and economic development will rely heavily on the harmony between its maturing market characteristics and development strategies appropriate to that market. However, the factors included in the analysis should not be limited to the categories listed in Chitty's model; especially, consumer behavior, the role of government, effectiveness of regulation, and the attitude of foreign investors should be considered. Nevertheless, those factors are not examined in detail in this paper, having been left to following studies. In addition, this paper is more focused on China's telecommunications industrialization in the manufacturing sector, which is hard technology. Chitty's model was initially introduced to explain telecommunications development in the Third World in terms of manufacturing industrialization; therefore, soft technology part, such as network operation and the service management, still remains untouched, except those related to this research. Further study is necessary in this area, which needs a different theoretical framework to be used.

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