



www.glocentra.com

TELECOMMUNICATIONS & INFORMATION TECHNOLOGY INDUSTRY DURING THE 1990'S IN CHINA

Abstracts

This paper is a case study that examines policy characteristics and trends as well as the market dimension in China's telecommunications and Information Technology sectors and how China shaped the development of a national telecommunications infrastructure. The related study offers thoughts on past and recent development of telecommunications services and sectors including how the Central Government have defined the position and channeled the role played by foreign direct investment and foreign companies to be an integral part of the national strategy of technological development.

The explanation of this process is conducted through the presentation of an overview on how the Central Government implemented gradual competitive framework between China telecommunications providers, stipulated new regulations on foreign ownership and oriented foreign investments to the equipment manufacturing while executing strategic adjustments to reinforce the market position of the national telecommunications providers. Using case studies approach, several aspects of China telecommunications policy are analyzed to demonstrate how China telecommunications plans were continually adapted to build a modern and sophisticated telecommunications network that harmonize the transfer of technology with the control of security, the application of national development and the preservation of national sovereign identity.

Contact: Said Cherkaoui, Ph.D.
Tel: 1 + 510-382-9040 – E-mail: glocentra@usa.com

Table of Contents

Introduction	3
The Ministry of Posts and Telecommunications	3
Local Competition: Unicom, China Telecom, MPT and Creation of Super Ministry of Information Industry	5
Regulations on Foreign Investment and Technology Transfer	10
Foreign Investments in China	13
Market Analysis: Cellular, Data Communication, Internet & E-Commerce	16
a) - Cellular Market and Service Providers	17
b) - Data Communication	19
c) - Internet Activity, Integration of Foreign Input and Competition	21
d) - E-Commerce Emergence	24
Internet Regulations, Obligations of Network Operators and Security Requirements	25
Next Stage of Development for Telecommunications in China	29
Conclusion	32
Appendices	36
Bibliographical Notes	47

Most used Abbreviations:

Ministry of Electronics Industry – MEI; Ministry of Foreign Trade and Economic Cooperation – MOFTEC; Ministry of Information Industry – MII; Ministry of Posts and Telecommunications – MPT; Ministry of Radio, Film and Television – MRFT; Posts and Telecommunications Authorities – PTAs; China United Telecommunications Corp. - Unicom Data Communications Bureau – DCB ; Special Economic Zones – SEZ

TELECOMMUNICATIONS & INFORMATION TECHNOLOGY INDUSTRY DURING THE 1990'S

Introduction

China remains the largest country in Asia, and it is also one of the oldest civilizations in the world, with over 5,000 years of history, and a culture developed over many centuries. China is the world's most populous country (1.2 billion, a fifth of world total) with a population continually growing and second largest in area (3.7 million square miles) to Canada with 75 percent of the population lives in rural provinces. From 1979 to 1997, China's GDP rose from US\$43.6 billion to a stunning US\$904 billion. China's GDP increased 7.1 percent in 1999 as against 7.8 percent in 1998. The Minister in charge of the State Development Planning Commission Zeng Peiyan said recently that China is to retain an economic growth rate of around 7 percent in 2000. China has reorganized its banking infrastructure in order to inject funds and to service foreign currency loans and foreign exchange operations in the regions where high-tech parks are located. The State Development Bank, modeled after the Development Bank of Japan, financed only projects that were in line with the government's

industrial policies, such as the newly created high tech industries, telecommunications companies, information and telecommunications infrastructure development.

Developing the Chinese information technology infrastructure through regional development plans became a major objective for the Central Government, which is supporting R&D projects in software development as well as major overhauls in the country's telecommunication infrastructure. Computer hardware and software vendors and manufacturers have been deregulated since 1985. Computer output from private enterprises continues to grow. Now more than 70% of China's software production is by private enterprises. In the Jin-qiao Export Processing Zone, in East Shanghai, 68% of the companies in the region are high-technology firms and they account for 74% of the area's total output.

The former Ministry of Electronics Industry (MEI) believed that increased domestic software development would energize its entire computer industry and become an important business sector of the national economy. MEI also considered that revenues from the software sector should account for more than 50% of China's total revenues from its entire computer industry. The Chinese government plan is still to reduce the technological gap with the rest of the Western nations. China has build regional nucleus to attract and develop high technology industries. Along and near China's coastline, high technology development parks were build as complement to the Special Economic Zones (SEZ) - Beijing / Tianjin, Guangzhou, Chengdu (Sichuan) and Dalian / Shenyang. The regional governments have oriented the related parks towards attracting foreign partners. Favorable tax laws for foreign funded enterprises were legislated. More recently, state-owned enterprises in these regions have received similar tax preferences. These incentives were also accompanied by strengthening the education and scientific research and development and the modernization of the telecommunications infrastructure. China's Minister of Information Industry (MII), Wu Jichuan, declared that the information industry would be a leading force in the national economy throughout the next ten years and that China's telecommunications market will reach levels of growth such as:

- The fixed-line telephone business still has much potential. Subscribers on backbone will double adding up to 200 to 300 million. Normal phone service in jumping-off area and Internet access service will become the major realm of growth.
- The number of mobile phones will continue to grow, with subscribers reaching 200 million.
- A new generation of public information networks relying on IP technology will continue to evolve and mature.
- Networking and digitalization by E-commerce, distance learning, telemedicine, home office will become popular in economy and society activity style.
- Communication and information services, IT equipment manufacturing and software development will grow faster than China's GDP. The effect of information industry will gain prominent footing in national economy. ¹

These projections are also extracted from the exceptional growth rates in China that had averaged almost 10% GDP growth per year over the last two decades. Chinese State

Development Planning Commission expected the Chinese economy to grow 7.8% in 1999.² By the year 2000, China expects the economy to record a yearly average of 7 percent growth in the first decade of the next century, doubling the GDP in ten years. According to a recent OECD study, China is set to become the world's biggest economy by 2020, surpassing the U.S. and Japan. Within this growth, telecommunications industry was considered as one of the pillar industries of China's economic reforms. China undertook a telecommunications development plan of unprecedented proportion. Since 1990, China has installed an average of eight million phone lines per year. Between 1991 and 2000, China will have spent \$100 billion on the infrastructure and the installation of 90 million lines.

Within this evolution, this study examines policy characteristics and trends and market dimension in China's telecommunications sectors and how China shaped the development of a national telecommunications infrastructure. It offers thoughts on past and recent development of telecommunications services and sectors including the position and role of foreign companies in such evolution. This paper provides an overview on how the Central Government implemented gradual competitive framework between China telecommunications providers, stipulated new regulations on foreign ownership and channeled foreign investment to equipment manufacturing while executing strategic adjustments to reinforce the market position of national telecommunications providers.

Using case studies approach, several aspects of China telecommunications policy are analyzed to demonstrate how China telecommunications development plans were continually adapted to build a modern and sophisticated telecommunications network that harmonize the transfer of technology with the control of security, national development and the preservation of national sovereign identity.

The Ministry of Posts and Telecommunications (MPT)

For decades, the MPT was the unique operator in the China while operating under the authority of the State Council. The MPT held direct responsibility for telecommunications policies, strategies and regulations even at the level of the inter-provincial network. Autonomy is granted to the provincial and municipal Posts and Telecommunications Administrations in planning and operating of their local networks. In 1993, China deregulated the telecommunications industry and allowed domestic competition with the monopolistic MPT entities in certain telecommunications markets. A limited area of value-added telecommunications operations was then open to competition through the creation of Liatong - China United Telecommunications Corp. (Unicom) - and Ji Tong Communications Corp.

Jitong, which focused on the domestic information service market, was formed by a consortium of 30 state owned enterprises and research institutes, and was allied with the former Ministry of Electronics Industries (MEI). In anticipation to greater competition, the MPT nominally

separates in 1994 its regulatory and operational arms by setting up a business unit called the Directorate Generale of Telecommunications, also known as China Telecommunications.

Throughout the decade, China has steadily revised upward its targets for the installation of telephone lines. During the eighties, China spent \$5.7 billion on telecommunications. Since then, China telecommunications recorded an averaged growth of 20.2 percent annually from 1986-1990 and 40 percent per year since 1992 becoming the fastest growing industry. Since 1990, an average of 8 million phone lines per year was installed. By the end of 1997, over 2,900 companies throughout the country had been authorized to operate value-added services and 90% of them operating paging services.

The MPT forecasted expenditures of US\$100 billion on infrastructure and the installation of 90 million lines between 1991 and 2000.³ The number of telephone lines has increased in China from 49 million (1994) to 100 million lines while developing the penetration rate from 3 percent telephone density to 8 percent by the end of 1997. China has been installing about 10-14 million lines per year. Part of that infrastructure outlay has gone to the construction of a long distance backbone that was completed in 1998. Consisting mostly of fiber optic cable and supplemented by microwave and satellite links, the backbone connects 30 provincial capitals and major cities. It also is tied to trunk networks in every province and is connected in a meshed network to international gateways in Beijing, Shanghai, and Guangzhou.⁴

However, China's telecommunications industry operated and still operates under a hierarchical structure with the State Council at the top, the commissions, ministries and provincial governments in the middle, and some 2,500 post and telecom administrations and enterprises at the provincial, municipal and county levels making up the base. The former MPT served as the central pillar of this structure, with the authority from the State Council to oversee and manage the day-to-day workings of this sector. The telecommunications sector included an aggregation of around 2,500 posts and telecom administrations and enterprises with 55,000 offices, some 16,000 town-village enterprises and user-owned dedicated networks.

The agencies had focus on policy, planning, manufacturing and services, but often their functions are overlapping. All central planning were handled by the central government. After taking giant steps toward the implementation of world-class telecommunications infrastructure, China turned its attention to data services. This responsibility was mainly given to the Data Communications Bureau (DCB), a department within China Telecom.

The DCB comprises 29 provincial Posts and Telecommunications Authorities (PTAs), all of which offer local and long-distance services. At the local level, every province is divided into prefectures, which are further divided into counties. Each prefecture has its own PTA and they all report to their provincial PTA. Network managers can go to the nearest PTA to apply for a connection. The PTAs in Beijing, Shanghai, and Guangdong also offer international services.⁵

"With the long-distance backbone complete, we can now roll out a lot of new services within a short time," says Ye Yong Dong, deputy chief engineer at the DCB. "We consider packet switching, digital leased lines, frame relay, and the Internet as basic data services." China's public data communications market has gained momentum during the nineties. In 1993, there were fewer than 3,000 subscribers to datacom services. That number increased to 14,000 and 60,000 in 1994 and 1995. By the end of 1996, the number of subscribers increased to 160,000. The public datacom service users reached 400,000 and 1.54 million at the end of 1997 and 1998 respectively.

Data communications services in China were and still are provided by the former Ministry of Post and Telecommunications (MPT), Ji Tong Communications Company, China Unicom and other Ministries. The MPT, through its national telecommunications operator, China Telecom, is the major provider of public data communications services. Within this expansion, China Telecom has opened 800 businesses to the public since September 1, 1998. In addition, various other ministries, such as the former Ministry of Railways, the Ministry of Power, the Ministry of Water Resource and the People's Bank of China, were also building data networks for their internal use.

China intends to continue its telecommunications expanding into the New Millennium. Meanwhile, regulations and structural and institutional reorganization are also developing and changing with the level of local competition, the stage of growth of the information and telecommunications infrastructure and the integration of China within the international market (See here Appendix 1 for the recent regulations).⁶

Local Competition: Unicom, China Telecom, MPT and Creation of Super Ministry of Information Industry (MII)

In 1994, China's telecommunications industry was deregulated. The Chinese central government dismantled the monopoly of the Ministry of Posts and Telecommunications by granting a consortium of three industries the right to compete with the MPT. During the same year, Unicom, a nationwide telecommunications enterprise to provide cellular and fixed line services, was created as an alternative government owned carrier formed mainly by the Ministries of Electronic Industries, Railways and Electric Power and 13 major companies. Unicom was allowed to expand the dedicated networks of some ministries, such as the Ministry of Railways (MR) and the former Ministry of Electric Power (MEP). It became the second nationwide basic and value added services operator in the local and long distance markets with estimated assets of RMB130m and was set up to compete with the MPT in the long-distance and international services market.

Unicom was the first state approved MPT competitor for telecommunications services while Ji Tong function was to compete with the MPT on networking services by building a nationwide network offering value-added services to government departments and the private sector. Later, Unicom was authorized to compete with MPT in almost all markets except the international services, MPT was still holding a dominant share in any given telecommunications

services market. However, Unicom was encountering difficulties caused by the interpretation of its allowable scope of service. The central government said that Unicom could offer "long-distance services," which the MPT referred to as only service to domestic long distance while Unicom contended that international services were included. Further, the government said that Unicom can offer services in regions "where there is a severe shortage in public telephone network capacity." The MPT interpreted this to mean rural areas only. But Unicom maintained that since "severe shortage" accurately described the capacity situation in most of China, it should be free to operate just about anywhere. In one way, these differences in the interpretation of responsibilities accentuated the imperative of reorganization of the telecommunications landscape in China, including the MPT.

The MPT is a functional department under the State Council, governing the post office, telephone system, and information technology for China. The ministry is responsible for controlling the nation's communications industry, making overall plans, coordinating projects and supervising operations. It exercises centralized control of the nation's public communications networks and the communications market, maintain the communications order and ensure the integrity, uniformity and the advanced features of the nation's public communications networks. The MPT was seen as gargantuan institution without a specific focus or expertise that is needed for the execution of an efficient development of highly sophisticated telecommunications network and services. While most foreign owned companies usually established a joint venture with either MPT or Unicom, regulations and restrictions on foreign investment have kept new competitors from growing to a size that might threaten the MPT's control of the basic infrastructure.

The only competitive threat could only come from a national provider that has the support of other rival ministries. The starting point was Unicom challenge to the MPT on several fronts. Unicom launched lucrative mobile communication services and lobbied hard for the right to be a full-fledged national operator. At the end of 1997, Unicom held only 4 percent of the mobile phone market. Most significantly, Unicom developed a long distance and international services network that will link 400 million people in 11 eastern provinces that represent 35 percent of China's population. The network consisted of a 5,000km submarine fiber optic cable stretching from Liaoning in the north to Guangxi in the south. The cable was linked to a terrestrial backbone incorporating telecommunications networks belonging to the railway and electrical power ministries.

Unicom provides long distance services, whereas a joint venture called Jitong, also backed by the ministries of railways, electrical power and electronics, offers Internet services. In other words, these ministries, by their backing of Unicom, now compete also with the MPT in the long distance telephone market. Conjointly, Unicom has devoted substantial effort over the past year to developing broadband access technology to compete with the dominant carrier, China Telecom, the favorite and protégé of the MPT. Unicom appears to have decided to use hybrid-

fiber-coax technology, which allows end users to receive voice, data and video over existing cable infrastructure.

Key to Unicom's competitive strategy is the alliance with Ji tong Corporations, which is licensed to provide data services, including Internet access, and the powerful MRFT and the aforementioned ministries, which operates an extensive cable network but is not authorized to supply voice or data services. Combining the power of the three organizations under the current regulatory structure could provide a powerful platform for launching competition against China Telecom.

Unicom, while providing cellular and fixed-line services domestically, encountered many challenges caused by a status of semi-privatization and suffered from clashing shareholder interests, lack of direction and the overhang of state bureaucracies. This entanglement added to the pressure of the entry of China in World Trade Organization (WTO) forced China Telecom and Unicom to seek a private status and to drop even some foreign investors. Unicom strategy was also shaped by China plans to impose strict regulations on foreign investment in Internet companies, including a cap on ownership while privatizing further Chinese Telecommunications such as Unicom and China Telecom. In 1997, the Chinese Government implemented a telecommunications law separating MPT's regulatory and operational functions and paving the way to the introduction of real reorganization and competition.

According to this reorganization plan, one of the major functions of MPT will be to make China's telecommunications industry more international. One way to do that was to separate the telecommunications sector from the postal sector.⁷ The subsequent transformation of China telecommunications industry was enunciated by two major organizational and operative changes.

The first one took place on March 1998, during the Ninth National People's Congress; the supreme legislative body of China authorized a drastic administrative reform that changed the State Council by axing 11 ministries and slashing the number of government officials in half. After the reorganization, the number of ministries had been reduced from 40 to 29. Fifteen former ministries and commissions have been removed and four new bodies have been formed. Government agencies, which have been completely dissolved, are the Ministries of Power, Coal, Metallurgy, Machine-Building, Electronics, Chemistry, Internal Trade, Posts and Telecommunications, Radio, Film and Television, Geology and Mineral Resources, and Forestry.

The MII also takes charge of the State Postal Bureau, which was founded in Beijing in March 1998 on the basis of the MPT and MEI. The new Super Ministry responsibility is to stimulate the manufacture business of information products, telecommunications and software industries, formulate sectoral programs, policies and laws codes, design an overall plan for telecommunications trunk networks (including local and long-distance telecommunications

networks), broadcast and television networks (including radio and cable television networks), and special-use telecommunications networks for military departments and other departments.

The MII exercises sectoral management, allocation of resources rationally, avoids overlapping projects and ensures information security. The government functions for information and network management in the Ministry of Radio, Film and Television (MRFT), China Aerospace Industry Corporation and the China Aviation Industry Corporation are incorporated into the MII. By the end of 1998, the Ministry of Information Industry, organized around 13 functional departments, had completed its merging of the former MPT and the MEI. One of the major functions of these 13 departments will be to internationalize China's telecom industry. Other major changes and reorganization in the telecommunications industry in China include the following:

- Increasing WTO pressure.
- New ministry (Ministry of Information Industry) overseeing the sector.
- Formation of a new cabinet favoring reform.
- Separation of telecommunications regulator from operation.
- Separation of post office services from telecommunications.
- First official joint venture in telecommunications services with AT&T.
- Reiteration of existing ban on foreign participation in telecommunications services.
- Trial of IP telephony services by China Telecommunications, Unicom and Ji Tong in over 20 major Chinese cities.
- Renewed support for China Unicom and the opening of the field to new players.
- Granting of a CDMA license to China Unicom,
- Transfer of CDMA Great Wall Networks and Guoxin Paging Company to Unicom.
- Breakup of China Telecommunications into four operating companies.
- Formation of a new telecom service provider formed by the Ministry of Railways, Chinese Academy of Sciences, the State Administration of Radio, Film and Television and Shanghai Municipal Government.
- Review of "China-China-foreign" financing structure with Unicom starting to notify foreign investors of its intention to terminate ties formed under the so-called "zhong-zhong-wai" (China-China-foreign, or CCF) financial plan.⁸

These reforms prepared the way to the second set of changes in China telecommunications orientation. Thus, a new opportunity was given to Unicom to be "reprivatized." Rumors were spread that an IPO for China Unicom might be forthcoming. While it had not yet been officially confirmed, the Unicom privatization was widely reported in the press. Later, a report in the official Wenhui Daily appeared to confirm that government approval had been given. The parallel approach of favoring privatization while Unicom continuing to notify foreign investors of its intention to terminate ties confirmed restricting foreign ownership on August 1999 formed under the so-called "zhong-zhong-wai" (China-China-foreign or CCF) financial plan. Unicom asked ChangAn Information (Group) to terminate its now-banned telecommunications

cooperation pact. Additionally, Unicom's plans for an initial public offering (IPO) were contingent upon successful extraction from its CCF agreements.

Unicom plans were to be listed on the New York and Hong Kong markets simultaneously (subject to their approval), with hopes to raise up to US\$1 billion in the offering, but questions concerning the disposition of an estimated US\$1.4 billion in foreign investment must be worked out first.⁹

Through this process, the Chinese telecommunications leadership was confronted with what is designated as the "two communicating vases." The CCF matter could cloud any of its efforts to raise capital in the US and European marketplaces while inhibiting the drive to join the WTO. This cause-effect correlation was also intensified by the initiative taken by a group of 16 Unicom venture partners who voiced their concern about the CCF matter by addressing a letter to Minister Wu. The same letter was copied to key decision-makers in the senior Chinese leadership.

This "premiere" multi-firm and multi-lateral effort expressed the determination of foreign investors and the shareholders to defend their interests by acting in unison and to obtain clarification from the Chinese government on their telecommunications policy.¹⁰ The foreign investors action and the Chinese government response exposed a new sophistication in the Chinese telecommunications industry. The Chinese telecommunications decision makers have shown a certain consideration for the experience of its foreign partners concerning the resolution of asset valuation and equity conversion issues. From the foreign investor perspective, through this unprecedented action in China, foreign telecommunications companies were positioning themselves in a more assertive role by developing a common stance and by trying to influence the Chinese government decisions, rather than simply accepting the delivery from Beijing of missives on policy reforms.

The Chinese leadership was fully aware of the crucial importance of the international financial community in developing its telecommunications infrastructure and in the financing of the economic development projects. Introduction of further competition and spinning off state monopolies were the first steps toward acquiring the support of the Western world. China government was still using alternatively the concessions and hard stand posture on issues related to the penetration of foreign direct investment in the telecommunications industry or in any other field considered sensitive for the national sovereignty.

On April 1999, MII's Wu Jichuan announced that China Telecom would be split four ways. China Telecom currently controls more than 90% of the market and has assets in excess of US\$67.6bn (or RMB560bn). A dramatic but ultimately successful offering of China Telecom in 1998 finally came to a head in July 1999. On April 2000, China announced it had officially finished restructuring China Telecom. Two separate companies emerged from this reorganization:

- China Telecommunications (Group) Co., with registered capital of 220 billion yuan (\$26.57 billion), controls the former monopoly's fixed line networks.
- China Mobile Telecommunications (Group) Co., with capital of 51.8 billion yuan, has inherited cellular networks across the nation with roughly 40 million subscribers.
- The two companies were functioning separately since the middle of 1999.¹¹

Because the administrative aspect of China's postal service and telecommunications has been separated from their business components through reforms, China Telecom is now an enterprise. China Telecom as an enterprise has integrated its decision-making concerning price adjustments. On August 2000, China Telecom reportedly planned to cut its domestic long-distance rates by 40 percent while almost doubling local calling rates. This would cost the company around 34 billion renminbi (US\$4 billion) but is a long-overdue adjustment in line with international practices.

However, an official with China's MII recently said that even though the country's telecommunications companies have been spun off from the MII, these enterprises still need the government's permission to adjust their calling rates. The government has the final say because the issue is telecommunications rates can affect Chinese people; therefore the government must decide whether to adjust prices. China's procedure for telecommunications rate changes is that once a telecommunications company made a proposal; it is followed by discussions with the State Council's various departments and ministries. Public hearings on prices are then held on the proposal before it is submitted to the State Council for final approval and then implementation.¹²

Similarly, the telecommunications administration of the MII remained responsible for the examination and approval of telecommunications equipment for network access and the issuance of Network Access License. China continues to develop a legal framework that responds to its internal technological needs of an authentic national development based on the use of national resources and logistics with access to foreign technologies that are innovative, transferable and adaptable to China own characteristics (See Appendix 1). Up to July 2000, while the telecommunications equipment business has already become one of the most open and competitive markets in China; no foreign ownership is allowed in the letter business.

Regulations on Foreign Investment and Technology Transfer

The 1993 Opinion of MPT forbade foreign entities from operating or participating in operating cable and radio communication business of public communication networks and special communication networks in China. Furthermore, no foreign investment in any form may be attracted. However, a 1994 Joint Investment Notice, allowed telecommunications enterprises to use foreign funds for joint investment in telecommunications projects in conformance with national policies and laws. Though Article 5 of the Joint Investment Notice reiterates that no

foreign party to a joint investment shall participate in the operation of telecommunications services. In 1995, this position was reversed, and Article 3 again forbade telecommunications services from absorbing foreign capital in any form or any manner.

In practice, a number of telecommunications construction contracts have been concluded. All of these telecommunications joint ventures were directly authorized by local administrations, often against the instructions of the MOFTEC. This Ministerial agency has indicated that while it will not take any measures against locally approved telecommunications joint ventures, it also will not provide any assistance in the event of a dispute among the parties or with the MPT.

In order to attract foreign investment and advanced technology, China has adopted a series of policies to encourage foreign investors to compete in its equipment market. According to the “Guidelines on the Industrial Catalog for Foreign Investment” issued in Oct. 1995, foreign investment is encouraged in the following areas:

- the manufacture of large-scale Integrated Circuits (LSICs)
- the manufacture of 900 MHz digital cellular mobile communication equipment
- the manufacture of digital microwave communications systems and measuring equipment
- the manufacture of asynchronous transfer mode (ATM) switching equipment
- the manufacture of key components for facsimile equipment
- the manufacture of satellite communications terrestrial earth stations (TES), data earth stations (PES), and key components
- the development and production of software, commercial satellite manufacture, satellite payload manufacturing, satellite applications
- the development of new fields such as information and communications networking technology, international economics, scientific, technological information service, etc.

China's has obtained advanced science and technology from foreign manufacturers, thus making it one of the largest users of foreign capital among developing countries. This has significantly reduced the technology gap between China and developed countries. In the telecom field, the former MPT has established as many as 67 Sino-foreign joint ventures. As of the end of 1997, their products were successfully installed over the country's SPC telephone network, mobile network, and optical telecom network.(6)

Until recently, MPT was the body that ultimately approves or refuses proposed telecommunications joint ventures and Wholly Foreign Owned Enterprises (WFOE). MPT was also the institution that allocated the resources among domestic owned and foreign owned firms. The extension of such power enabled the MPT to hold a direct control of the market and supervise the competition between foreign companies while Chinese entities reach their own agreements. In reality, China relies heavily on foreign capital for development of its telecommunications industry. Many foreign companies are very eager to invest in China but China's restrictions on foreign investment are a hindrance in many cases. First, China required that all foreign investors establish joint ventures with Chinese companies to teach advanced

technology and management ideas. All foreign telecommunications companies must work with a Chinese partner, normally a privatized branch of the MPT, on any infrastructure development or marketing projects.

China allowed the establishment of WFOE, equity or contractual joint ventures in manufacturing of communication equipment. But in all types of telecommunications services, China strictly prohibited foreign investors to operate, or take part in operations, whether they are provided as part of the public communications network or as specialized, dedicated communication networks.

China's plan is to import advanced technology from foreign manufacturers. Chinese telecommunications industry is in dire need to invest in R&D in both fixed and mobile network technologies. To reach a western stage of development, China will have to dedicate more resources to learning from joint venture partners and to consider cooperating with both Chinese and foreign telecommunications firms to develop key technologies such as ATM, synchronous digital hierarchy, digital exchanges, and TDMA- CDMA - and GSM based cellular technologies.¹³ In this perspective, the nature of related contracts with foreign partners could be more carefully considered. Research might be sponsored at international institutions so that Chinese staff could learn abroad, while foreign scientists could be employed or sponsored in Chinese laboratories. Technology transfer from the West is vital to the Chinese telecommunications industry. Because of the massive demand for telecommunications services in China, the majority of the two Chinese operators' revenues were invested in network construction, leaving only a small amount for technological research and development. In 1994, China imported \$4 billion worth of telecommunications equipment. SRA projects that the country will import \$11 billion worth of equipment annually by the year 2000.

All these considerations have imposed to the Chinese Central Government to encourage competition in the telecommunications equipment market. In order to attract foreign investment and advanced technology, China adopted a series of incentives and policies to stimulate foreign investments and competition in its equipment market. According to the "Guidelines on the Industrial Catalog for Foreign Investment" issued in October 1995, foreign investment was encouraged in the following areas:

- The manufacture of large-scale Integrated Circuits.
- The manufacture of 900 MHz digital cellular mobile communication equipment
- The manufacture of digital microwave communications systems and measuring equipment
- The manufacture of asynchronous transfer mode switching equipment
- The manufacture of key components for facsimile equipment
- The manufacture of satellite communications terrestrial earth stations, data earth stations and key components
- The development and production of software, commercial satellite manufacture, satellite payload manufacturing, satellite applications

- The development of new fields such as information and communications networking technology, international economics, scientific, technological information services.¹⁴

The recent reform and reorganization of telecommunications administration favored the emergence of a the Super MII which has substantial number of Chinese regulations that relate to information technology and can be defined in the following functional areas:

- Intellectual property protection.
- Import and transfer of technology.
- Setup of telecommunications systems.
- Publications and publishers.
- Setup and use of computers and networks.

On December 13, 1999, MII's Wu Jichuan made clear existing foreign investments in Internet companies would be "dealt with" so they matched the terms of the landmark China-U.S. agreement paving the way for China to join the WTO. Under last month's agreement, foreign companies are allowed to hold 49 percent equity stakes in telecommunications companies from the start of China's WTO accession, rising to 50 percent after two years. It was unclear what would become of existing foreign investments in Internet sites, which exceeded 50 percent. "Clearly these businesses are in violation of current Chinese policies [and] we shall find an appropriate way to address it," Wu Jichuan said in an interview with the Asia Wall Street Journal. "Whether your business be high-tech communications or selling fruit, you need a license," he said. A licensing regime could give authorities broad powers to reject foreign investment in certain areas, citing, for example, loosely defined national interests or security concerns. Wu Jichuan said government ministries would monitor Internet sites; "we will not allow the introduction of trash that is harmful to the people."¹⁵ The Asia Wall Street Journal estimates the current foreign investments in the Chinese Internet at about US\$ 100 million, but much more is in the pipeline.

Foreign Investments in China

In the early 1980's, China initiated an open door policy. This policy has been implemented by measured steps and continues today. Because of the way China governs its economic and politic systems, change may appear slow to foreign observers. However, the Chinese are conservative by nature, and have also witnessed virtual collapse of governing institutions in many other 'socialists' countries that were undergoing similar transitions. Despite its measured approach, the Chinese government has accomplished much in the area of development, in general. The country has been remarkably successful in attracting foreign investment. At first, a cordon was erected around foreign investments, with the establishment, in 1980, of four SEZ in the south, offering tax and other incentives. Such privileges were later extended across most of the country. By the early 1990s, China was the largest recipient of foreign direct investment in

the developing world. After Deng Xiao Ping Southern tour in 1992, localities were competing with each other to offer foreign investors the most attractive terms.

The importance of foreign capital (direct and indirect) in the Chinese economy is making inroads in the design of the Central Government planning. This impact is reinforced at the level of the transfer of technology and the modernization efforts taken by regional governments where some of the advice offered by foreign companies comes close to actual control to the development of the telecommunications infrastructure. For years, the Chinese government has not allowed foreign ownership of telecommunications systems. The joint ventures were mostly manufacturing of telecommunications parts. The government departments as well as the provincial agencies handle the operations and management of telecommunications infrastructure. China restricts direct foreign investment in telecom industry by requiring investment through another Chinese party. Until recently, MPT maintained a significant amount of control over China's telecommunications infrastructure. Additionally, Part policy-maker, part regulator and part operator, the MPT was also the largest revenue contributor to China's State Council. In 1993, the MPT's revenues were US\$3.9 billion, of which \$2.7 billion originated from international operations. In 1994, almost 17 percent of its financing were raised from foreign loans and investments, 42 percent from installation fees, and the rest came from other domestic sources.

China also ranks first in the region in terms of foreign investment – according to a United Nations study, some US\$37 billion was pumped into China in 1995, accounting for more than half of all foreign investment in Asia Pacific. Between 1979 and 1996, a total of \$174.9 billion of foreign direct investment was actually put in place. A total of 283,344 contracts were signed over the same period; the total value of contracted foreign investment between 1979 and 1996 was \$469.1 billion. By the end of 1996, there were 240,447 registered enterprises with foreign capital in China, with a total pledged capital of \$441.5 billion, of which foreign partners provided \$289.9 billion. And the spending isn't limited to the major coastal regions. While the city of Guangzhou, for instance, remains an important commercial hub because of its proximity to Hong Kong, smaller cities like Shenyang, Xian, and Chengdu also are seeing an infusion of offshore cash. ¹⁶

The former MPT has established 67 Sino-foreign joint ventures. As of the end of 1997, their products were successfully installed over the country's SPC telephone network, mobile network, and optical telecom network. Equipment sales remain the most important source of earning for foreign companies conducting business operations in China. Wu Jichuan, the new Minister of the Ministry of Information Industry, said that telecommunications equipment business has already become one of the most open and competitive markets in the country. Numerous multinational enterprises such as AT&T, Motorola, Siemens, Nortel, Mitsushita, Nokia and Ericsson already have a foothold in the Chinese telecommunications market and plan to be there for the long term. Siemens Ltd. China has a leased-line network connecting 13 manufacturing operations in six cities and plans to extend that to four more within three years. "Our network in China will be bigger than the rest of the Siemens' network in North Asia," says Friedrich Fleischmann, Regional Manager. Its workforce also will grow – by the end of the decade; Siemens plans to employ 30,000 people in China, up from 6,000 now. In 1998, Lucent Technologies estimated telecommunications trade opportunities with China to be at least a \$50 billion. Bell Atlantic, the world's largest telephone directory publisher, has become the first foreign company in China's telecommunications market. The US giant became the sole agent for yellow page advertisements in Shanghai by setting up a joint venture with the local telecommunications administration. 10 percent of the Motorola's global sales are in China, and Germany's Siemens is expected to have annual sales of 1.5 billion marks (\$800 million) in China by the year 2000. In 1998, one tenth of the Motorola's global sales are in China, and Siemens is expected to have annual sales of DM1.5 billion in China by 2000.

On the other side, Nokia as a first-stage invested more than USD 50 million in building the Nokia (Suzhou) Telecommunication Co. Ltd. to manufacture cellular network products which include effectively GSM base stations and transmission products for Chinese and Asian customers. Nokia factory, located in the Industrial Park of Suzhou, a city about 100 km west of Shanghai in east China's Jiangsu province, started trial operations in 1998 and began deliveries in January 1999. "The formal opening of the Nokia Suzhou factory in the year 2000 coincides with the 15th anniversary of Nokia's entry into China," says Mr. Veli Sundback, Executive Vice-President at Nokia. "With technology transfer programs, know-how is transferred from other Nokia units to the Suzhou operation and its local suppliers, making it one of Nokia's main manufacturing sites in Asia." Nokia currently employs in China approximately 3,500 people. "China's telecommunications market has seen rapid development in recent years. We are highly confident that this new enterprise will succeed and contribute to this development," said Mr. Xie Jia Bin, chairman of the Industrial Park of Suzhou. With many technology innovations Nokia has strengthened its market position as a leading supplier of mobile and fixed communications systems and equipment in China. At present, China is Nokia's second largest country in the world in terms of sales revenue, and Nokia's investment in China already exceeds USD1 billion. Nokia has established seven joint ventures; one wholly owned manufacturing plant and a research & development center in China.

Until the recent signing of the trade treaty with the US as precondition for membership in the WTO, China maintained control over the telecommunications playing field by preventing foreign companies from having equity in Chinese companies, or direct operational control over their Chinese ventures. "We still have difficulties in letting foreign counterparts get involved in China's telecommunications service sector because conditions are not ripe," Wu Jichuan said.¹⁷ Furthermore, Wu Jichuan argued development of the telecommunications services sector was still largely dictated by government policy rather than market economies, and was therefore unsuitable for foreign involvement. "China's telecommunications industry has followed a long and tortuous course. The reform and opening up, and the modernization drive, which started in the late 1970s, have facilitated vigorous growth in the telecommunications sector. Now, this sector has embarked on a course of development with Chinese characteristics and we will stick to it unswervingly so as to realize the modernization of telecommunications preliminary in the early next century."¹⁸

Foreign telecommunications investors have tried to circumvent legal barriers levied by the Central Government in regards to conduct establish and conduct business relationship with Unicom. One of the methods used by foreign companies to avoid the official ban was through a shaky financing scheme called China-China-Foreign joint ventures. These methods allowed them to take an indirect stake in networks owned by China Unicom. However, Beijing cracked down in 1998 and ordered the CCF ventures to disband. Of the two-dozen foreign telecommunications companies that participated in the arrangement, most have agreed in principle to dissolve the joint ventures and withdraw. But several are still locked in negotiations with China Unicom over the terms of their settlements.

European Union negotiators are actually seeking to recover millions of dollars in back payments owed to foreign firms since China Unicom stopped sharing revenues last October, and to help foreign firms secure settlements in U.S. dollars for easy repatriation. Similarly, "European Union's negotiators are seeking the right to 51 percent foreign ownership of Chinese telecom firms as part of talks to secure China's entry to the World Trade Organization. The demand goes beyond the 49 percent ownership rights negotiated last year by the United States on mobile and fixed-line networks, and 50 percent for value-added services, including the Internet."¹⁹

Market Analysis: Cellular, Data Communications, Internet & E-Commerce

China with its 1.2 billion population constitutes a huge market potential for all sectors of telecom applications. Currently the telephone density for China is low as compared to other developing countries. Satisfying the needs of its people will be a major task for the government to achieve. In addition, as the standards of living improve more and more people will be able to afford new phones, pagers, cellulars, access to the Internet and conduct business transactions on-line.

a) - Cellular Market and Service Providers

Among the fastest growing telecom sectors in China is the wireless communications market. The cellular and pager markets have both proliferated rapidly in large part due to the shortage of telephones and the general lack of telephone cable infrastructure. Since 1990 the number of cellular subscribers has jumped from 18,000 to 600,000 in 1993. From 1988 to 1995, the average annual growth rate in mobile subscribers was over 200 percent and the growth rate was over 160 percent during the 8th Five-Year Plan (1991-1995) period. Until 1994, not one ministry regulated the use of wireless devices that resulted in interference between network frequencies. During the year 1994, the number of wireless subscribers increased to 1.5 million and the MPT was eager to capitalize on such growth to reassert its control on the entire wireless communications market by the use of satellite-based telecommunications services that is still under strict state control.



Unicom's activities were confined to mobile telephone and paging services in a few cities. In 1995, the MPT registered DGT as a business unit called China Telecom, as a first step toward transforming this division as an independent operator. In response, Unicom elaborated expansion plans to respond to MPT's competitive strikes and to anticipate on the growing demand for the cellular services. Unicom launched competitive drive by introducing cellular services in China's four largest cities – Beijing, Tianjin, Shanghai, and Guangzhou. By mid-1995, an additional 1 million subscribers started using cellular phones bringing the total number of subscribers to 2.5 million. The competition between the MPT and Unicom intensified further in 1996 when Ji Tong Communications joined Unicom to offer telecommunications services. By the end of 1996, some 3.5 million mobile subscribers were added making the total number of mobile subscribers in China to exceed 7 millions. In 1997, the MPT's plan was to reach 4 million subscribers for its mobile network while Unicom was preparing to build out more GSM networks across the nation.

China's cellular market, with 27 million subscribers in the first quarter of 1999, is currently the third largest in the world. China expects to have 70 percent of the cellular capacity being digital by the end of 2000. The Government estimates that by 2010 there will be 200 million mobile phone users in the country - still only 15% of the population.

Altogether there are 30 cellular telephone providers. In fact, only Unicom has a license to compete with China Telecom. A smaller company, Century Mobile Communications Corp -- which is part owned by the military -- also provides cellular service. Combined, Unicom and Century Mobile have only about 12 percent of the national market.²⁰ Due to the rapid demand, many cellular providers are focusing on improving the quality of their services by deploying digital networks to replace the current analog networks. The adaptation of digital technology will also enable E-business to be wireless. MeetChina.com has plans to transmit information to suppliers via pagers or wireless phones, which are far more common in China than PCs. In Hong Kong, AOL and Hang Seng bank plan to implement a COD technology called mobile point-of-sale (M.POS), which centers on a wireless credit and debit card-authenticating device.

Foreign companies are competing for a share of China's wireless internet market: Motorola, Ericsson, Nokia, Lucent, Siemens, Alcatel, Microsoft, New World Mobility, Phone.com are all developing portions of the next delivery systems for Internet services. On March 2000, Lucent Technologies Inc. communicated that it had won contracts worth more than \$100 million from several Chinese service providers. About 60 percent of the value of the contracts came from China Unicom, the country's number two telecommunications provider.²¹ Motorola is the leading provider of cellular phones in comparison to all the foreign investors in China's telecommunications market, having sold \$1.78 billion of cellular phone equipment and pagers. Motorola operates 26 vans that are on the road all year, visiting 600 cities in a grass-roots marketing exercise. Motorola ads hammer home the message that mobiles bring business breakthroughs and consumer peace of mind. Status and fashion also figure in the appeal. Kung Hing-Tong of Lucent Technologies (China) says mobile phones have changed the way of life in China, where travel can be expensive and difficult.²² However, Motorola's lead is eroding in face of tough competition from North European-based telecommunications companies, Nokia and Ericsson. Motorola had made a strategic mistake in not investing in new digital systems, and European vendors, like Ericsson and Nokia, took advantage of this lapse. GSM was a way to link formerly incompatible cellular systems among European countries, and now 120 countries have GSM networks with over 120 million subscribers. One advantage is roaming, where phones can be used in other countries with GSM networks; by 2000, as much as 40 percent of all GSM users will be in the Asia Pacific region.

“Currently Ericsson supplies half of the analog and digital cellular networks in China, and has a Beijing-based training center, employing over 3,000. China has just surpassed the United States as Ericsson's biggest market; already it accounts for 10 percent of Ericsson's worldwide

handset sales. Last year, Ericsson had contracts to double Shandong and Heibei provincial GSM capacity to 3 million and 1.2 million subscribers, respectively. Other GSM contracts include Liaoning for US\$218 million, Heilongjiang for US\$119 million (the Harbin city network) and Jiangsu for US\$105 million. Almost all GSM networks have been 900 MHz systems, but now superior GSM 1800 MHz systems have been installed in some urban areas.”²³

b) - Data Communications

China's public data communications market has surged since 1993, when there were fewer than 3,000 subscribers to datacom services and a jump to 14,000, 60,000 and 160,000 respectively in 1994, 1995 and 1996. The public datacom service users reached 400,000 and 1.54 million at the end of 1997 and 1998 respectively.²⁴ The public data communication networks have provided a platform on which other government agencies and industry groups develop their specialized networks and applications. The data service that's been around the longest in China is Chinapac, an X.25 offering that went into full operation only in 1993. It has access points in 2,000 cities (90 percent of the country) and connections to 23 other countries via X.75 gateways. But while Chinapac has been praised for its reliability, customers have criticized the high usage fees: it costs approximately US\$70 to send 1 Mbyte of data within China and US\$220 to send it to a foreign destination. That has some users making the move to China DDN (Digital Data Network), the digital leased-line service introduced in 1994. China DDN is now available in 60 percent of the country, with 30 major cities connected to the backbone; 25 of these cities have also built their own DDN networks.

At present, the major public datacom service users are government ministries and departments, the financial community, industry enterprises, research institutions and universities, such as the People's Bank of China, major commercial and specialized banks, the National Foreign Currency Administrative Bureau, the National Foreign Currency Regulatory Center, the Debt Department of the Ministry of Finance, the People's Insurance Corporation, the Safety Insurance Corp. and all major stock exchanges in China. These users have used ChinaPAC or ChinaDDN to build their own computer management information systems and real-time information process systems. In fact, China DDN's reach is growing – a DDN network will soon link six cities in Inner Mongolia. Next on China's to-do list is frame relay and the DCB planned an investment of US\$8 million frame relay backbone to connect 21 provincial capitals. The DCB intended to also offer a mobile data network in Beijing, Shanghai, and Guangzhou, with plans to extend it nationwide if there's enough demand. At the same time, it's building a nationwide Electronic Data Interchange (EDI) network to boost electronic commerce between China and the rest of the world. The China Public EDI Business Network deployment seek to cover 13 major cities and will be linked to the global EDI backbone run by GE Information Services. Additionally, new technologies such as Code Division Multiple Access, Wireless Local Loop, and Personal Handy-phone System were tested and implemented with new spectrum allocated. Mobile satellite and personal communications services based on GSM are considered for near future.

Finally, a separate MPT department rolled out nationwide ISDN services by 1997. There already are ISDN links from Beijing and Shanghai to Japan, Hong Kong, and the U.S. The cities of Guangzhou and Shenzhen are carrying out trials and may offer ISDN in 1998.

While the Chinapac and China DDN backbones are proving robust, local access lines are another story altogether. Customers report that outages are shorter and less frequent than they once were. The problem is that there are still pockets of outdated infrastructure in the MPT network, mostly copper links. Reliability varies from place to place and ranges from good to just plain bad. In some places, people can get 28.8 kbit/s on a dial-up line, and in others, people can't even get 1.2 kbit/s. However, if offices were located in an older part of the city, it would definitely be more difficult to get a good access line. While long outages are now rare, breaks lasting several hours still happen. For example, Johnson Electric Industrial Manufactory Ltd. (Hong Kong) has encountered local-loop woes. The company has six 64-kbit/s leased lines running from its head office in the New Territories (part of Hong Kong) to its factory in Shenzhen. "It's very unreliable," says Project Manager Griffin Lam. "It goes down at least twice a week and for about half an hour each time. Sometimes all six lines go down together, especially if it rains."

On the upside, the PTAs are responding more quickly to customer complains. "Two years ago, it took them two to three days, sometimes a week, just to fix a fault. Now they will fix the fault as soon as it's detected. They're also more willing to consider customer requests. Since the problem is with the access lines, we asked the local PTA for permission to lay our own fiber from the exchange to our factory. They are receptive to the idea," says Griffin Lam. The reason of such improvements is that between 1994 and 1996, China has made impressive progress in data communications and demonstrated great potential in all types of data communications equipment markets. Telecommunications industry received major financial support from the state owned banks. The former MPT has used \$6.6 billion US of foreign investment to develop its telecommunications infrastructure through loans, leasing and installment financing. The plans are to lay another 100,000 km of optical fiber by the end of the decade with a total of over \$12 billion per year on the MII telecommunications infrastructure development. A significant part of this investment will be on data communications networks and equipment. China telecommunications policies mandate that only advanced digital switches will be installed, for managing communications traffic on a network of fiber optic cables. This installation had made the competition hotter between companies providing data services over high-speed communications backbones. Besides China Telecom and China Unicom, China Network Communications Corp (China Netcom) and Ji Tong Communications Corp are all battling for pieces of the related market segments.

C) - Internet Activity, Integration of Foreign Input and Competition

On the Internet, even less than 1% of China's population is online; the current figure of 6.7 million makes it the 8th most wired country in the world.²⁵ Official estimates state that 4 million Chinese were online by the end of 1999 with encouraging projections of 10 million Chinese online by 2000 and 33.14 million by 2004. On the technology forecasting, growth is also on the horizon: 40 million home PCs, 400 million TV sets and 30 million web TVs by 2003.²⁶

CHART: Asia-Pacific Internet Users by Country (1996-2001)

Country	1996	1997	2001
Australia	1,000,000	1,600,000	5,300,000
Taiwan	590,000	870,000	3,350,000
Korea	155,000	325,000	2,900,000
China	70,000	250,000	2,700,000
Malaysia	90,000	210,000	1,750,000
India	40,000	200,000	1,800,000
Singapore	150,000	255,000	900,000
New Zealand	210,000	310,000	740,000
Thailand	80,000	150,000	630,000
Hong Kong	200,000	275,000	700,000
Indonesia	60,000	115,000	550,000
Philippines	40,000	70,000	420,000

Source: The New Century Group

Excluding Japan, the region will see the number of Internet users balloon at a compound annual growth rate of 52 percent, from 2.69 million at the end of last year to 21 million by 2001. The region shows a wide range of environments in which the Internet will blossom or be stunted, according to the report. Countries facing the fewest obstacles are those that have already developed mature Internet communities, including Australia, Hong Kong, New Zealand and Taiwan. Those facing the greatest obstacles include China, India, Indonesia, the Philippines and Vietnam.

To date, the development of the Internet has been strongest in Australia and Taiwan, which together accounted for more than half the region's total number of users in 1996. In the years to come, the countries poised for strongest growth are those where Internet penetration has been most limited: China, India, Korea and Malaysia. Despite a daunting array of challenges, the Internet will see continued strong growth in the Asia-Pacific region through the start of the next decade. In fact, according to a recent survey, the number of Internet users in China nearly doubled to 17 million in the first half of the year 2000: from 8.9 million Chinese Internet users at the end of last year, the number leapt to 16.9 million by the end of June 2000.²⁷

In China, previously the MPT and now the MII owns an Internet service - known as Chinanet - which has the most comprehensive coverage. There are connections in 30 major cities, with plans to extend it further within the provinces. Ji Tong Communications Co. Ltd., the state-owned VAN operator has also launched its Internet service. The other Internet services include CASNet, which is operated by the Chinese Academy of Science and links all research organizations in China, and CERNet, an educational and research network operated by several universities. Since 1991, Chinese institutes and universities have been building local area networks and linking them to one another. Connections to the worldwide web arrived in China in 1993, with academia being the first area to benefit from this connection. Links with scientists from the United States and Europe have had a major impact on Chinese R&D efforts in engineering, physical, biological and chemical sciences. The Institute of High Energy Physics (IHEP) built the first Web Page in China in 1993 and was the first Chinese University to be connected to scientists via e-mail in the United States. IHEP continues to be a primary provider of international e-mail in China. Despite the proliferation of academic networks in China, the growth of links to the World Wide Web remains limited in number.

China has big plans for establishing domestic links to the Global Information Infrastructure (GII). The planning and implementation of the GII-related projects involve the guiding hand of the government assigning priority to key projects, such as those that involve joint research and development with foreign scientists. Foreign investment is also playing a major role in China's GII plans. China's Internet consists of a network of internal electromechanical phone networks developed by the Chinese People's Liberation Army, and the petroleum and railway ministries. Each of these organizations wants a stake in the present and future development and modernization of China's Internet and will have to cooperate in these projects to ensure that they continue to go according to plan. The Three Golden Projects are the crux of this strategy, consisting of the Golden Bridge, Golden Card, and Golden Customs projects. The Golden Bridge project is a state-owned information network providing the integration of network and satellite communications with fiber optics and ISDN. The Golden Card project will facilitate the distribution of credit cards in China, while the Golden Customs project aims to revamp China's customs operations by replacing foreign trade paperwork by utilizing EDI. General Electric Information Services (GEIS) is one company that is playing a big role in its joint venture with the Great Wall Computer Company to offer e-mail and EDI software and services. By working with Great Wall, GEIS' products can be altered to meet local technical requirements.

Development of the Internet for commercial purposes is a relatively new phenomenon but is also a major priority of the Chinese government. As opposed to the high-speed information super highway in the United States, China is currently building a medium-speed state information highway. Most of China's Internet connections consist of copper wires, although ISDN and T1 lines are slowly emerging in the country as Internet connections. To date, China's domestic networks offer on-line services other than those that link users to the Internet. These services include e-mail, file transfers, remote login, conferencing, and EDI. Electronic mail is the most common use on the Internet.

The potential market is staggering. China is considered to have two million computers of which only 50,000 has Internet access that make some one billion out of the 1.3 billion populations - have never heard of the Internet. Other figures state that only 1.6 percent of Chinese families owns a computer and as much as 86 percent of China's citizens have never touched a computer. Based on these figures, sales of PCs are forecasted to be at seven million to ten million over the next two years for 1999, China will be the world's third biggest computer market.²⁸

Conservative estimates make China a current host-country of more than 1.5 million web sites with over 80,000 companies connected to the Internet. According to this study, of the 4.5 million Internet users in China, 85 percent are men. Xinhua, China's official news agency, reported that the average net user in Beijing spends almost 35% of his salary accessing the net, as compared to about 1% in the US. And access to foreign sites is limited. Despite the high costs for Internet usage to scholars (\$1.75 per hour of use from 1994 statistics), e-mail demand is very heavy. However, the relative domestic liberalization of the telecommunications industry have increased a sort of competition among Central Administrations and related affiliated telecommunications companies.

This competition has also evolved in promoting more sophisticated means of access while reducing the cost of the Internet access. At the end of August 2000, China Telecom expressed a serious willingness to increase its share of China's Internet-access market by announcing on the launch of a new half-price Internet Access card (IAC). "Purchasers can use the IAC to access the ChinaNet platform and surf the Internet simply by dialing one local telephone number - 163. In addition to being easy to use, the IAC also can be used anywhere within the borders of the mainland. The IAC charges customers based on the actual time they use the Internet—and their phone charge for accessing the Internet is only half that of regular local phone calls. The IAC is also technically advanced. It provides customers with high-speed Internet access through an integrated service digital network."²⁹

In response to this, on December 4, 2000, Unicom announced plans to build a multi-million dollar VoIP network consisting of five hubs in Beijing, Shanghai, Chengdu, Shenzhen and Guangzhou, connecting 319 cities across 30 provinces in China. When completed, this Cisco-supplied network will be the world's largest national dedicated VoIP network. According to Probe Research, actually around 7.7 billion minutes of voice traffic are transmitted via packet networks per year and China's VoIP services are expected to account for up to 20% of all packet-based telephony traffic carried worldwide by the year 2005. At this date, it will equal more than 60 billion voice minutes according to the research. China now has four official VoIP carriers. Unicom and new carriers China NetCom and Jitong have been making steady progress in the IDD market against incumbent fixed operator, China Telecom.

d) - E-Commerce Emergence

Seductive statistics abound. Though less than 1% of China's population is online, the current figure of 6.7 million (given reports of multiple users sharing single accounts, the actual figures are probably higher) makes China the 8th most wired country in the world. And the Ministry of Information Industry, whose midyear estimate of 4 million Chinese online by the end of 1999 was handily overtaken, recently released some encouraging projections: 10 million Chinese online by 2000 and 33.14 million by 2004. The Ministry's technology predictions look equally rosy: 40 million home PCs, 400 million TV sets and 30 million web TVs by 2003.

In fact, China government initiatives have demonstrated staunch support of E-commerce. With China's forthcoming membership in the WTO, restrictions on foreign investment in both telecommunications and Internet sectors have been eased. The country has begun to develop a more international approach to intellectual property rights, and has focused on the development of its technology, telecommunications and information industries. The government-backed Shanghai Technology Stock Exchange opened December 28 1999. Several other E-business initiatives are also in development, among them the recently founded E-commerce institute at the South China University of Science and Technology.

Local web sites and Internet businesses are flourishing, too. Chinadotcom Corp's shares have climbed to nearly six times their original IPO price. Incubators such as CyberLabs have sprung up to nurture fledgling Chinese Internet businesses. Leading mainland portal Sohu.com garners over 5 million pageviews daily, while newcomer Myrice.com jumped from zero to 1.5 million pageviews/day in just four months. Start-ups also have a Silicon Valley-esque embarrassment of venture capital riches from which to draw. IDG announced plans to funnel \$1 billion into Chinese Internet-related companies by 2005; entities as diverse as Yahoo, Intel, Goldman Sachs & Co. and U.S. TV evangelist Pat Robertson have invested as well.

Perhaps most importantly, at least as far as immediate e-commerce initiatives are concerned, China does not yet have a fully developed electronic payment structure in place. While credit card transactions have been taking place on both the consumer and business levels, the government has not yet been able to implement a nationwide credit card verification process (most cards are linked to the issuing bank). But the Chinese government has been working on such issues, and hopes to complete the Golden Card project - which includes the creation of a nationwide, inter-bank credit card-clearing service - some time in the year 2000.³⁰

Though China's E-commerce infrastructure is still in development and the numbers can be less than encouraging, Western investors and entrepreneurs alike have no reason to shy away from the "sleeping giant." What they do have to keep in mind is that -- given vast differences in government policy, telecommunications and financial infrastructure, and culture -- China's E-commerce is developing, and will continue to develop, in ways very different from U.S. and European models. And these ways are well worth watching.

Internet Regulations, Obligations of Network Operators and Security Requirements

The first official Internet link was opened in China in May 1995; since this date, the Internet market has shown a steady growth. According to the MEI, more than 100,000 individuals had registered to hook up with Internet during 1996. The MPT has approved four official gateway providers to run networking services. China currently has around 250,000 to 275,000 Internet subscribers and about 50 Internet service providers (ISP). Certain analysts estimate that the Internet market in China will grow at an annual rate of 100-150 percent over the next three years in terms of Internet users, reaching over 2 million users by the year 2000.³¹

On February 1996, the State Council published the first set of regulations on computer networking. Subsequent Internet Measures deal with the approval process for interconnected networks. These measures specify that applications must be made to the MPT, and require information on the scope of the network, its connecting units and the channels required. After review and approval, the MPT is obliged to provide the channels within 30 days. However, the approval process may take years. Permit to operate is allowed to an applicant that is a legal person with the ability to provide long-term service to subscribers. The cooperative joint venture must be incorporated. Eventually, a network may require its own direct international connection (through the inbound and outbound channels provided by MPT and presently the MII) thus becoming an interconnecting network. This change would require approval from the State Council Leading Group on Information, which is responsible for coordination of all regulations, as well as the approval of all new interconnected networks, per Article 7.³²

MPT was the sole authority over granting of licenses to commercial ISPs, and so far, it is one of only four permitted to operate backbone networks with international access. To exert additional control over information dispersal and state security the Ministry of Public Security issued a Notice, which requires all individuals and connected units (which includes the proposed intranet) to register with the public security bureau.³³ In the same range, the former MEI - actually named Ministry of Information Industry - authorized China Golden Bridge network to serve as the interconnecting network for also the purpose to reinforce the monitoring of Internet access and provision. The connectivity to the China Golden Bridge network is governed by specific measures in accordance with the regulations. On the other side, Jitong Communications Company is the key independent operator of the network and is the clearinghouse that accepts applications by companies who intend to connect to the international network through the Golden Bridge.

Once Jitong verifies the compliance of the applications, the MEI decided for approval. If MEI approved the application, a dial-in agreement was executed. Within 30 days of the execution, Jitong provided Internet access or in case of delay will notify the applicant.

Concerning networking, the Provisional Regulations of the Peoples Republic of China for the management of International Networking with Computer Information Networks remain the primary rules and stipulations. These regulations cover all computer networks that can directly connect to international networks (called international connections). These regulations were amended by the 20th May 1997 Decision of the State Council which modified the Provisional Regulations in the following areas of definitions:

- Interconnected Networks are defined as computer information networks and carry out international networking, which is the connection of Chinese computer networks with foreign computer networks.
- Connected Networks are defined as domestic computer networks that connect to interconnected networks to carry out international networking (an intranet would be considered as a connected network).
- Connected Units are defined as entities responsible for the operation of a connected unit. Presumably, this refers to any computer network that has a permanent international link via an Internet backbone.

Article 6 of the amended regulations requires all parties who directly carry out international networking use the inward and outward channels provided by the MPT. Within this Ministry, the Director General of Telecommunications was responsible for providing such channels. Such a regulation is clearly aimed at maintaining control over the import and dispersal of information.

Furthermore, no individual or unit can establish another data channels, meaning that if a foreign business uses a hotel long distance telephone service to connect to an Internet service outside of China (for example an ISP in Japan), then it is in breach of the regulations. Though the regulation is probably not completely enforceable, it stands as a fundamental impediment to the establishment of viable ECommerce in China. Similarly, assume that a Chinese firm and a foreign firm sign a joint venture contract, and it is approved by the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) or by the Provincial commission for Foreign Trade and Economic Co-operation. Also assume that the import of the needed equipment is approved by MOFTEC under the 1985 Technology Transfer Regulations and the joint venture will be charged the appropriate import tariffs when the equipment is imported. Under this scenario, the foreign firm is unlikely to have a permanent international connection, but would instead connect through a major Chinese Internet link such as ChinaNet or the Golden Bridge Network. In this case, the project would be classed as a Connected Network, especially if the project wished to offer dial-in connection to registered users, thus acting like an ISP.³⁴

Where The Commonwealth Telecommunications Act of 1997 has one all encompassing term such as Carriage Provider, the Chinese regulations make distinctions. However, in reality, it is nearly impossible to say where one network ends and another one starts, especially when using wireless technology or leased cables. Under Article 8, if the joint venture project is considered a connected network; it will be obliged to apply for an international networking business permit before accessing the Internet through an interconnected network. This application must include information on the nature and scope of the network and the physical address of its mainframe. Since all new telecom equipment sold in China must obtain the new network access license and the equipment with the old MPT-issued type approval certificate must exchange for the new one and/or be re-certified, the new policy concerns all telecommunications equipment vendors, both Chinese and foreign. A network access license is the first thing a foreign telecommunications vendor must acquire to be able to sell or offer its services and products.

On December 31, 1998, the MII decreed a new regulation titled the “Arrangements for the Approval of Network Access of Telecommunications Equipment”, which has been in effect since January 1, 1999. Under this new type approval regulation, telecommunications equipment without a Network Access License (NAL) and a Network Access Identifier (NAI) cannot be sold, advertised or used in China. Therefore, all telecommunications equipment to be used in public or private telecommunications networks in China must obtain a NAL and NAI from the MII. Authorized by the Telecommunications Administration of the MII, two License Processing Offices opened office in Beijing to administer the applications for network access of telecommunications equipment. Regional telecommunications administration authorities are responsible for the supervision of and control over network access of telecommunications equipment in their respective regions. End-to-end provisioning is also a problem. A network manager who wants to install a link between two cities has to submit separate applications to each PTA. On top of that, the building landlord has to submit applications on the net manager's behalf. Getting the lines on time means staying on top of the PTA – which may even then take as long as six months to process an application (for more details, see here in Appendix 1: PART TWO: The Interconnection of telecommunications networks).

All entities engaged in international networking are obliged to abide by state laws, and may not use international networks to jeopardize or disclose state secrets or produce, retrieve, reproduce or disseminate material that is obscene, pornographic or would hinder public security. This last rule is particularly onerous for businesses that set up networks which are used by people who could potentially access a pro-democracy, human rights web site. Such actions may mean that the network controller is disseminating material that is hindering public security, and may have its license cancelled or face criminal sanctions. A possible technical solution to this difficulty can be found in the use of blocking or filtering software that will make only pre-approved sites available to users. Furthermore, such a ruling is supported by Article 51 of the Chinese Constitution, which provides that the exercise of citizen rights and freedoms, such as freedom of speech enjoyed by the citizens under Article 35, may not infringe on the interests of the State.

Finally, Article 54 stipulates citizens must not commit acts detrimental to the security, honor and interests of the motherland. Security was and is still the priority in China considerations of the development of telecommunications network, including the Internet. Within this legal framework and until recently, the MPT, which was the country's largest telecommunications network supplier and the country's official telecommunications regulatory agency indicated that foreign control of networks could endanger national security. Therefore, foreign involvement in the telecommunications sector should be and can be limited to sales of hardware and switching equipment, products that China cannot yet produce efficiently.

The Chinese government put into effect a new, more thorough set of regulations governing the hooking up of domestic information networks with international networks. The Leading Group on Information Advancement under the State Council, China's cabinet was empowered to oversee the field. All entities that wanted to engage in business activities related to international networking had to apply for a license. In their application, these organizations should provide data on the nature and scope of their networks, and the addresses of their computer hosts. Access units should be capable of providing long-term services to their customer base, or their license will be canceled. Violators will be ordered to cease networking services and will be fined as much as 15,000 yuan (US\$1,800 – 1998 rate).

Chinese enterprises wanting to hook up to the Internet now face a longer checklist to qualify for government approval. More recently, authorities are requesting that all companies and individuals officially register for approval for the Internet to use encryption technology, which protects electronic communication from eavesdropping.” End of March 2000, China telecommunications authorities enacted even new regulations on the Internet that limit foreign stakes in Chinese Web sites to levels laid out in "relevant laws" - or between zero and 49 percent. The aim of these new Internet regulations is to preserve the national sovereignty, national moral integrity, and spiritual cohesion and stop the leak of “state secrets.” China's definition of state secrets is so broad it can encompass any information not approved for publication. These prohibitions include everything from information that "harms the reputation" of China or that hurts reunification efforts with Taiwan, to that which "advocates cults and feudal superstition.” (For more details refer here to Appendix 1).

Similarly, politically sensitive content on line is banned. Firms must apply for licenses to run their Web sites and may be fined or shut down if they deviate from their stated business plans or fail to enforce content restrictions. Web sites must censor and report illegal content, and they must record everything that appears on their sites - including comments in online chatrooms - for 60 days. Web firms must open the records to police on demand and remain responsible for blocking vast categories of content, from pornography and gambling to content with political commentary that the Communist Party views as threatening. Under these new rules, operators of Internet bulletin boards, chat rooms and newsgroups are responsible for any security breach, including through email.

These rules have not altered the determination of Web companies seeking to establish a presence in the Chinese market. Wang Zhidong, president and chief executive officer of Sina.com, and U.S.-listed Chinese Web firm, said he was not worried the rules would hurt his company. Sina has already enacted 24-hour supervision of its chat rooms and stores all the content that appears online, he said. The company keeps in regular contact with police, but most cases concern hackers or suspected criminal activity. Inquiries about politically sensitive content are "very rare", he said.³⁵

As far as communicating with a consumer audience is concerned, there are alternatives to the PC. Cable television is already a noteworthy commercial medium, some media consultant reporting television shopping revenues as high as \$150 million. China has one of the biggest subscriber bases in the world, and its cable prices are low enough (about \$12-18/year) for most to afford. With such an infrastructure already in place combined to the trend of price reduction of the Internet access, interactive TV initiatives and increase of competitive pricing for Internet access might well prove to be a great potential for E-Commerce development.

Next Stage of Development for Telecommunications in China

China is considered as one of the World’s most attractive telecommunications markets. From Western perspective, China is viewed as the engine of growth for the region and for the World in the near future. Eventually, China could become the world’s largest market for information technology.³⁶ Since the 1980s, telecommunications has been the fastest growing sector in China with an annual growth averaging 20.2% from 1986 to 1990 and 45.9% from 1990 to 1994. In the first half of 1995 alone, China's telecommunications industry grew at a rate of 45.2% each month. Currently, China has 3.2 telephone lines per 100 people, a high growth from the low rate of 0.6 per 100 people in 1985.

Table I: China Ascendant

Year	1992	1993	1994	1995	1996
Fixed lines (m)	11.5	17.3	27.2	40.7	54.9

Source: ITU

In 1996, China added more than 14 million new telephone lines – almost 30% of all the new lines installed in the world that year. In that year it also added more new cellular phone users than any other country except the US, and is now the world’s third largest cellular market. However, phone subscribers accounted for only 6.3 percent of the country's population, including telephone lines or mobile phones. According to a 1997 survey, 68.9 percent of the families without telephones said that they planned to install phones within the next three years. Among the households having phones, 35.1 percent expressed the hope to change to better or add new phones. In terms of phone models, 41.2 percent care for composite phones, 38.6

percent for ordinary phones, 18.23 percent like answering machines, and 0.79 percent prefer cordless phones.

Moreover, 59.4 percent of the respondents said that price is the most important factor when purchasing a phone. Since the early 90's, yearly installation of phone lines and usage of mobile phones reached double-digit rates.

In fact one of China's most effective instrument was to allow telecommunication companies to establish an initial telephone installation fee to be paid by applicants prior to installation that enabled the telecommunication sector to raise financial resources without any cost. Through this fee, China's telecommunication sector gathered large financial resources that were invested in the construction of a telecommunications infrastructure. In 1997, China invested 124.5 billion yuan (US\$15 billion) in building up its posts and telecommunications infrastructure. According to the Ministry of Foreign Trade and Economic Cooperation, the country imported nearly \$6 billion worth of electronic and telecommunications equipment. Chinese spending is expected to exceed 150 billion yuan (\$18 billion) in 1998, while business in these sectors is expected to grow 28% over 1997. In the process, China imported nearly US\$6 billion worth of electronic and telecommunications equipment. China plans to increase the number of telephone lines from 49 million in 1994 to 100 million by 2000 and increase the penetration rate from its current 3% teledensity to 7%. Other figures stated that by 2000, China now plans to have installed 123 million telephone lines for a density of 10 percent (30 percent to 40 percent in the cities), with an exchange capacity of 170 million lines, according to the Telecommunications Research Project. To achieve this objective, China will have every year to install about 24 million lines.

As China continued its re-organization of government institutions and industry and its infrastructure development, it would open up its telecommunications when conditions were ripe. As long as it can continue to tap the international investment community for capital, China will be able to become a more active participant in the world's information-based economy. However, it will require much more administrative streamlining within the government, and far greater transparency to investors and users. On the other hand, the rapid improvement in infrastructure has been nothing but a boon to foreign companies doing business in China. In 1998, Lucent Technologies estimated telecommunications trade opportunities with China to be at least a \$50 billion.³⁷ As long as foreign companies have the equipment to sell and the knowledge to transfer, they will have a ready market, even if they fail to establish more than a foothold there. Meanwhile, newer Chinese enterprises such as Ji Tong Corp. and Unicom – shareholder-based but largely state-controlled – tend to do business on their own.

The telecommunications infrastructure in China is undergoing a major transformation that the Central government considers as a major priority in its development policy. This symbiotic and synergistic identification is China's greatest advantages in the development of the Chinese nation as an economic space, international trade partner and regional political ally. The ongoing development of the Internet and installation of telecommunications lines throughout the entire

country will benefit the population by enhancing their productivity and thereby stimulating China's much-needed social and economic reforms.

In addition to financial and legislative backing from the central government, regional governments, especially those of the five SEZ, are learning to use tax credits and other means to lure domestic and foreign manufacturers of computer and telecommunications-related products into their regions. It is important to note that the SEZ are the centers of most information technology activities in China. These zones are Beijing/Tianjin, Guangzhou, Chengdu (Sichuan) and Dalian/Shenyang.

In the less developed provinces, there is minimal if any telecommunications infrastructure, which is to China's advantage. Rather than replace obsolete copper wires throughout the country, telecommunications firms can lay fiber optic cables or build microwave systems and satellite stations from scratch. China's rapid growth in the telecommunications business will also provide many new job opportunities for Chinese that are currently getting laid off from government-owned industries. Therefore, China's telecommunications industry does provide attractive opportunities for foreign investors. Since government regulations limit foreign companies to only installation projects, barring them from any type of operational activities, foreign investors should consider investing in the rural regions where telecommunications are most needed.

Overseas investment in Chinese telecommunications operators is now strictly forbidden. But Washington won a six-year timetable from Beijing that pries open the market. In value-added telecommunications services, China agreed to permit foreign stakes of up to 50 percent within two years of China's accession to the WTO. Ownership in mobile networks would be phased in more gradually, starting at 25 percent after one year in the cities of Beijing, Shanghai and Guangzhou, rising to 49 percent after five years, when geographical restrictions would be lifted. Fixed-line and international long-distance networks would permit 49 percent foreign ownership in six years. The European Union was attempting to raise the barriers to 51 percent across the board, the source said.³⁸

In near future we will see much more advanced export products from China, such as mobile phones, digital switchboards, and computers, fax machines, cars and car components. These will be truly "made in China", not just assembled, as is often the case today. Actually, the regional concentration of the high-tech firms, the laying of the foundation for an information super highway and the related local dynamism created an economic dualism within China in regards to the economic and technological disparity between these SEZ and the rest of the country. These imbalances will put a pressure on the dependence on cheap labor and simple technology as tools for growth. The State-Owned Enterprises and the Township and Village Enterprises need to modernize their facilities, integrate innovative technologies, form and employ more technology-oriented managers to increase their value added input. The local manufacturing of more value added and the production of Information Technology oriented products are needed to sustain China's technological drive toward implementing a highly developed telecommunications infrastructure.

This is also one of the reasons explaining the previous insistence of the Chinese government on the transfer of technology by foreign investors. A new formula of sharing access to technological knowledge and know-how is on the agenda of the negotiations between China leadership and the Western world.

Conclusion

An abundance of optimistic and an effervescence of seductive statistics had flourished in the Western Capitalist World about the China. The related enthusiasm stimulated a huge interest about China as marketplace in the U.S and Europe mainly based on a continual use of rosy forecasting on China's growth both economically and in population.³⁹ In reality, China continues to face Third World socioeconomic challenges and First World technological imperatives. While the interior in the mainland remains underdeveloped, the maritime façade of China is reflecting the increase integration of the Chinese economy in the global market. China is made of the old and the modern style of living. A wide contrast remains between the rural and in land areas from the coastal regions. While an austere and Third World environment dominates in the rural internal states, the wealthy coastal inhabitants, in regions like Guangdong, snack at McDonald's, own homes, surf the Internet and take trips abroad.⁴⁰ The other structural impediment to the development of China, in general and of the telecommunications infrastructure in particular, is the general lack of education among China's rural population. Successful growth of the telecommunications market will require a generalized educated among the major part of the population.⁴¹

These imperatives of modernization and innovation find determining factors in the educational system, source of qualified work force and the hub for research and development in China. The Chinese government effectively considers transfer of technology from advanced countries as the bridge to implement technological modernization and economic development plans that will benefit the entire Chinese nation. China requires that all foreign investors establish joint ventures with Chinese companies to transfer and implement locally advanced technology and management ideas. All foreign telecommunications companies must work with a Chinese partner, normally a privatized branch of the MPT, on any infrastructure development or marketing projects. This entails navigating through a heavy-handed and often corrupted process. In addition, the government levies high tariffs on computers and peripherals imported from abroad. As a result, many products are smuggled in to China. Relating to China's frequent monetary squeezes, the government often restricts hard currency allocation to importers and imposes import license fees.

However, China still faces big challenges on another front: customer service. The situation at the Beijing PTA, for instance, is typical. Only three people are assigned to order processing – one for international circuits, one for long-distance, and one for local. If they're busy, customers have to wait.

“They don't seem to have a first-come, first-served policy, I have been waiting for a line for nine months, and I know a company that got one in just three.” says Siemens' Fleischmann. Bargaining in China is a complex process, taking place both among internal players – such as government ministries, the People's Liberation Army, provincial governments and local posts and telecommunications authorities -- and external players including foreign telecommunications carriers, equipment suppliers and government agencies.

The Chinese nation once known to the Western World, as the sleeping giant isn't just awake, it's on the move--reinventing itself in the image of Asia-Pacific powerhouses like Hong Kong and Singapore. And as the last great communist stronghold moves tentatively toward capitalism, it's also in an all-out rush to build a world-class telecommunications network by the end of the decade. The government is installing millions of phone lines, while EDI, frame relay, and ISDN are scheduled for commercial roll out. Competition, while limited, is fueling foreign investment – which in turn is driving even more development. China seems to be ready to increase international cooperation in telecommunications fields. Since China is the center of Asia, it will be a leader in this region and propose that APEC members jointly develop standards for wide band multi-media communications and E-commerce and study tariff and settlement arrangements on the basis of equality and mutual benefits. At present, the Chinese Government still has remarkable influence on telecommunications fees as well as the direction the industry should take in regards to cooperation, partnership and alliance or joint venture with foreign investors and telecommunications companies.

In September of 1998, the MII has banned the China-China-Foreign joint venture structure, that use to enable investors to avoid restrictions through a joint venture with a Chinese partner which would then in turn form a joint venture with the target (in practice with China Unicom). As explained in previous pages, the main challenge remains in this context is how to extract foreign companies engaged in illegal joint ventures. The European Union and the United States have effectively mounted a tough stance on these issues in anticipation to the negotiations on the China entry in the WTO. In response, China has suggested when it will join the WTO, it might open paging services to foreign suppliers, with mobile telephone to follow suit within five years. In the meantime there are considerable restrictions on foreign involvement in several high-technology sectors including telecommunications.

China's restrictions on foreign involvement in telecommunications services were considered among the tightest in the world. As China deals with information technology and networking, there is massive resistance within the Chinese government and telecommunications industry to ceding ownership to foreign firms that can be expressed through the following fundamental and strategically opposing forces:

- The first is China's desire to protect its security and its political morality through a strict control of the dispersal of information if not sensitive intelligence that may be subversive or contrary to Chinese national interests (see Appendix 1 for more indications).
- China telecommunications plans were continually adapted to build a modern and sophisticated telecommunications network that harmonize the transfer of technology with the control of security, national development and the preservation of national sovereign identity.
- The second is the hindrance of the free flow of commercial information to reach all segments of the market can prevent the world most populated country from integrating mainly the still developing global electronic commerce and secondly the continuing information revolution.
- More advanced international E-Commerce, which still need to be facilitated by more reliable secure means and government regulations of the Internet, can bring these two forces into immediate conflict, considering that to receive the benefits of the Internet goes hand in hand with certain flexibility and acceptance of its inherent social and cultural detriments.

Prior to the ministerial reorganization, the MPT planned gradually to open up the country's telecommunications market to the outside world. Today, it is the Ministry of Information Industry who will have the mission to take the leap forward for the integration of China telecommunications in the World marketplaces. As the country's telecommunications market opens wider, a more flexible fee system and structure of foreign ownership of certain telecommunications sectors will come into being and allow China to use telecommunications as a major leverage in trade with its major trading partners and secondly with the rest of the world.

Chinese leaders sometimes have two different mindsets when it comes to modernization is obvious from their treatment of the Internet in China. They have discovered that the technology China needs to build the most powerful country on earth in the 21st century threatens to undermine the institutions that rule the nation. Their fascination with anything high-tech, their understanding of the necessity to enter the information technology highway, is tainted by the realization that the Internet undermines the hierarchical control of Chinese society. At times, they have strictly regulated access and blocked sensitive Web sites, at times they have relaxed controls. This kind of "policy alternance" translates in the Internet field one of the major characteristic of the Chinese negotiation style with foreign and international carriers.

In the short and medium terms, China remains firmly anchored within the socialist market economy as framework and with oriented and target policies aimed to reform certain economic sectors essential to China national and technological development. This cohabitation of socialist ideology and pragmatic capitalist policies has nowhere being applied than in the telecommunications and information technology industries. For China leadership, these two areas are the pillars remain for a national economic development that harmonize the joining of the global trading system with the strengthening of a national cohesion and centralized development strategy for cohesive regional integration. China efforts to maintain a traditional control over key industries and sphere of decision are just an expression of wider concern for the possible dismantling of national industrial policy, reduction in building national enterprise and

loss of political and social communication that remain in a socialist path the sine qua non conditions for an effective social control.

China leadership within the State apparatus and the Communist Party is well aware of the fact that full adaptation of liberal policies, made and formulated in Westernized fashion, can undermine their respective power basis and ideological legitimacy as the final bastion of socialist driven national aspirations. China commitment to these national obligations is shaping and distilling the rhythm and the timing of the introduction of market reforms in the telecommunications industry like elsewhere.

Appendix 1: Telecommunications Regulation of the People's Republic of China
(*Chinese version taken from Xinhua 10/01 and then translated and edited.*), Source:
madeforchina.com

Order of the State Council of the People's Republic of China (no.291) At the Thirty-first Session of the Standing Committee of the State Council held on the twentieth day of September 2000 the Telecommunications Regulation of the People's Republic of China was passed. It is now promulgated and effective.

Premier Zhu Rongji

September 25, 2000

Attachment : Telecommunications Regulation of the People's Republic of China

SECTION ONE: GENERAL GUIDELINES

Article 1: The regulations hereafter are formulated with the purpose of regulating the telecommunications market, securing telecommunications networks and information and promoting the stable development of the telecommunications industry.

Article 2: Any telecommunications activity or activity related with telecommunications conducted in China should comply with these regulations.

Telecommunications activity referred to in this regulation is defined as the transmission, emission or reception of voice, words, data, images and information of any other form through the use of wire lines, a wireless electromagnetic system or a photoelectron system.

Article 3: The Ministry of Information Industry (MII) is entitled to oversee and control the telecommunications industry of China in compliance with the telecommunications regulation.

The telecommunications administrations of provinces, autonomous regions and municipalities directly under the central government shall supervise and control the telecommunications industry under the leadership of the MII in a manner consistent with their respective authority and in practice according to the regulations.

Article 4: The surveillance and control of the telecommunications sector shall be based upon the following principles: the separation of administrative departments and enterprises; the break down of monopolies and the encouragement of competition, transparency, fairness and just practice.

Telecommunications carriers shall abide by laws, follow commercial morality and accept supervision and concede to examinations according to the laws and regulations.

Article 5: Telecommunications carriers shall provide fast, accurate, safe and economically reasonable telecommunications services to telecommunications customers.

Article 6: law protects the security of the telecommunications networks and information. No entity or individual is allowed to employ the telecommunications network in activities that harass national security, public interest or the lawful rights of other people.

SECTION TWO: THE TELECOMMUNICATIONS MARKET

PART ONE: Telecommunications Service License

Article 7: The state categorizes telecommunications services and establishes license regulations. To engage in telecommunications services, a telecommunications service license must be acquired from the telecommunications administration of a province, autonomous region or municipality directly under the central government.

Before acquiring the telecommunications service license, no entity or individual is allowed to engage in telecommunications service.

Article 8: Telecommunications service is categorized into basic telecommunications service and value-added telecommunications service.

Basic telecommunications service means the provision of public network infrastructure, the transmission of public data and basic voice communication. Value-added telecommunications service means the provision of telecommunications and information services through public networks.

The categorization of telecommunications service is detailed in the attachment of the regulation "Telecommunications Service Category". The MII has the right to adjust the items of the category in the future according to the situation then and publish the new list.

Article 9: Engagement in basic telecommunications service must be examined and approved by the MII beforehand, and requires the Basic Telecommunications Service License.

Engagement in value-added telecommunications service with coverage in more than one province, autonomous regions or municipalities directly under the central government, must be examined and approved by the MII and requires the Multi-regional Value-added Telecommunications Service License. Those with service coverage in one province, autonomous region or municipality directly under the central government should be examined and approved by the telecommunications administration of the province, autonomous region or municipality beforehand and must acquire the Value-added Telecommunications Service License.

The engagement of any new telecommunications services that employ new technology and are not included in the Telecommunications Service Category should be reported to the telecommunications administration of the province, autonomous region or municipality directly under the central government and registered.

Article 10: A telecommunications carrier must meet the following conditions to engage in basic telecommunications service:

1. The telecommunications carrier is a professional company lawfully established engaging in basic telecommunications services and China owns the stakes or owns no less than 51% of the stakes

2. The telecommunications carrier has a feasible research report and technological plan for setting up networks
3. The telecommunications carrier has capital and professionals appropriate to the services engaged
4. The telecommunications carrier has a premise for engaging in the service activities and corresponding resources
5. The telecommunications carrier has the credit or ability to provide long-term services to customers
6. The telecommunications carrier meets any other conditions required by the state.

Article 11: When applying to engage in basic telecommunications services, an application shall be submitted to the MII, and the documents required in Article 10 shall be submitted at the same time. The MII should complete an examination of the applicant's qualification within 180 days starting from the day the application is received and conclude a determination of approval or non-approval. To those who are approved, a Basic Telecommunications Service License will be granted; and to those who are not approved, a notification of non-approval should be sent to the applicants in written form as well as the reason for rejection.

Article 12: The MII should take account of national security, telecommunications network safety, sustainable use of telecommunications resources, environmental protection and the competition status of telecommunications market etc. when examining the application for engagement in basic telecommunications services. The Basic Telecommunications Service License shall be granted through a bidding process according to the relative state regulations.

Article 13: A telecommunications carrier must meet all of the following conditions to engage in value-added telecommunications service:

1. The telecommunications carrier is a company lawfully established
2. The telecommunications carrier has capital and professionals appropriate to the services engaged
3. The telecommunications carrier has the credit or ability to provide long-term services to customers
4. The telecommunications carrier meets any other conditions required by the state.

Article 14: To apply to engage in value-added telecommunications services, an application shall be submitted to the MII or to the telecommunications administration of the province, autonomous region or municipality directly under the central government, and the documents required in Article 13 shall be submitted at the same time. The MII or telecommunications administration of the province, autonomous region and municipality directly under the central government should complete examination of the applicant's qualification within 60 days starting from the day the application is received and conclude a determination of approval or non-approval. To those approved, a Multi-regional Value-added Telecommunications Service License or a Value-added telecommunications Service License should be granted; and to those not approved, notification of non-approval should be sent to the applicants in written form as well as the reason for rejection.

Article 15: In a case in which a telecommunications carrier intends to alter its service scope, the main body of the carrier, or terminate operations, the telecommunications carrier should

submit an application 90 days in advance to the administration which granted the License and go through the relevant formalities. In the case of operation termination, the telecommunications carrier should take measures to settle any possible issues caused by the termination, as required by relative state requirements.

*Article 16: After having been approved to engage in telecommunications services, the applicant should go to the Enterprise Registration Administration with the lawfully acquired license and go through the registration formalities.

An Operator of dedicated telecommunications networks that provides local telecommunications service shall submit an application according to the conditions and procedures prescribed in the regulations for the approval of a telecommunications service license and undertake the above-mentioned registration formalities.

PART TWO: The Interconnection of telecommunications networks

Article 17: Telecommunications networks shall be interconnected on the basic principles of technological feasibility, economical reasonableness, fairness and justice, and reciprocal cooperation.

A major telecommunications carrier should not refuse the request of other telecommunications carriers and dedicated network operators for interconnection.

The major telecommunications carrier mentioned above refers to the telecommunications carrier that has control over necessary telecommunications infrastructure and owns a large market share in the telecommunications service market and has the ability to give substantial influence to other telecommunications carriers' entrance into the telecommunications service market.

The major telecommunications carrier shall be determined by the MII.

Article 18: The major telecommunications carrier shall draft out a transparent and non-discriminatory interconnection rule that includes the procedure of network interconnection, a time limit and a list of unbundled network elements. The interconnection rule shall be reported to the MII for review. The interconnection activities of telecommunications carriers are subject to the rules.

Article 19: The two parties aiming to interconnect Networks shall negotiate to bring about interconnections between public telecommunications networks or between public and dedicated telecommunications networks, as required by the regulation of the MII for network interconnection. The two parties shall sign a network interconnection agreement and the agreement should be reported to the MII to be filed.

Article 20: In the case that a network interconnection agreement is not arrived at through negotiation, any party can present a petition to the MII or telecommunications administration of the province, autonomous region and municipality directly under the central government, depending on the coverage of network interconnection, for their coordination within 60 days counting from the day of submission of the request for interconnection. The administration receiving the petition shall coordinate on the basis of the principle set forth in paragraph 1 of Article 17 of the Telecommunications Regulation to help the two parties reach an agreement. If an agreement cannot be reached within 45 days starting from the date of the submission of the petition, the coordinating administration shall invite telecommunications technology specialists

and other random specialists to hold an open discussion and propose an interconnection scheme. Then the coordinating administration shall determine the network interconnection scheme proposed by specialists and enforce an interconnection.

Article 21: The two parties of the network interconnection agreement must implement the interconnection scheme within the agreed or determined time limit. No party is allowed to terminate interconnection without the approval of the MII. In the case that technical obstacles are found in the network interconnection, the two parties should take immediate effective steps to remove the obstacles. Any dispute in network interconnection between the two parties shall be resolved pursuant to the procedure and method under Article 20 of the regulation. The communication quality of the network interconnection shall be up to relative state standards. The quality of the network interconnection service that major telecommunications carrier provides to other telecommunications carrier should not be lower than that of the service provided in its own network or to its subsidiary branches.

Article 22: The settlement and sharing of network interconnection expenses should follow the relevant state rules. No extra charge in addition to the prescribed standard is allowed. The MII shall establish the technological standards, the rules for expense settlement and detailed control regulations.

PART THREE: Pricing Standard of Telecommunications Service

Article 23: The telecommunications services shall be priced on the basis of costs, taking into account advances in society, the national economy and telecommunications industry and the customer's affordability.

Article 24: Telecommunications services are charged at market rate, or at the rate directed by the government, or at the rate fixed by the government respectively.

Basic telecommunications services are priced at rates fixed or directed by the government or the market rate. Value-added telecommunications services are priced at market rate or at the rate directed by the government.

Telecommunications services that have sufficient market competition are priced at market rates. The MII shall propose a categorized list to specify the telecommunications services that should adopt rates fixed by the government or rates directed by the government.

Article 25: As to important telecommunications services that adopt rates fixed by the government, a standard draft rate will be proposed by the MII. After consulting the opinion of the Price Administration of the State Council, the standard will be submitted to the State Council for approval and then enacted.

As to services that adopt rates directed by the government, a standard rate range will be made by the MII after consulting with the opinion of the Price Administration of the State Council and then enacted upon. The telecommunications carriers can fix their own rates within the standard range and report the rates fixed to the telecommunications administration of the province, autonomous region or municipality directly under the central government for file.

Article 26: The telecommunications service fixed rates standard directed by the government shall be made by the means of holding a hearing so as to learn the opinions of the telecommunications carriers, telecommunications users and other parties.

Telecommunications carriers shall provide accurate and complete cost data and all other relative data as requested by the MII and the telecommunications administration of the province, autonomous region and municipality directly under the central government.

Article 27: The government's principle on the utilization of telecommunications resources is unified planning, centralized management and appropriate allocation. The system of utilization with compensation is adopted in practice.

The telecommunications resources mentioned above refer to radio frequency, satellite orbit locations, and telecommunications network numbering and other limited resources utilized to make telecommunications functions possible.

Article 28: Telecommunications carriers shall pay the telecommunications resource fee for occupancy and utilization of telecommunications resources. A standard charge shall be developed by the MII in conjunction with the Financial Department and Price Department of the State Council. The charge standard will be reported to the State Council. After being approved by the State Council it will be enacted.

Article 29: The allocation of telecommunications resources shall take into account the long-term plan, and the use and the anticipated service capacity of telecommunications resources.

Telecommunications resources can be allocated by means of either an auction or by designating a telecommunications carrier. The telecommunications carrier that has acquired the right of employing telecommunications resources shall utilize the allocated resources within the required time limit and the utilization should reach the required minimum scale. Without the approval of the MII or the telecommunications administration of the province, autonomous region and municipality directly under the central government, one is not authorized to use the transfer or lease of telecommunications resources or to alter the use of the telecommunications resources.

Article 30: After the user of the telecommunications resources has lawfully acquired the telecommunications network numbering resource, the major telecommunications carrier and other concerning units are obliged to adopt necessary steps to cooperate with the user of the telecommunications resources to realize the functions of the telecommunications network numbering resource.

When there is a special provision in the laws and decrees, the provision of the laws and decrees shall prevail.

SECTION THREE: TELECOMMUNICATIONS SERVICES

Article 31: A telecommunications carrier should provide services to telecommunications users according to the telecommunications service standards prescribed by the state. The category, scope, standard rate and time limit provided by a telecommunications carrier should be published and reported to the telecommunications administration of the province, autonomous region and municipality directly under the central government to be filed. Telecommunications users have the right to choose lawful telecommunications services.

Article 32: When a telecommunications user applies to install or move telecommunications terminal devices, the telecommunications carrier shall guarantee the completion of installation and start of service on a timely basis. In the case that the telecommunications carrier delays in installing and starting services due to its own reasons, the telecommunications carrier should pay

1% of the installation fee or moving fee or other fees for every day's delay to the users as compensation for the inability to fulfill the agreement.

Article 33: When telecommunications users inform the telecommunications carrier of a barrier to telecommunications service, the telecommunications carrier should fix the problem within 48 hours if the barrier is in a town, or 72 hours if the barrier is in a rural area. If the problem cannot be fixed in the above time period, the telecommunications carrier should notify the user in a timely manner and remit the monthly fee for compensation of the delayed period. But this provision does not apply to the case that telecommunications service barrier is caused by the terminal device.

Article 34: The telecommunications carrier should provide telecommunications users with convenience when one is paying fees or checking bills. The telecommunications carrier should provide billing details for domestic long-distance communications, international communications, mobile communications and information services free of charge at the customer's request.

In the case that an abnormally large bill for service fees appears, the telecommunications carrier should notify the user as soon as possible after discovering the abnormality and take steps accordingly.

The abnormally large bill mentioned above refers to fees suddenly exceeding 5 times the average amount of the telecommunications service fee for the previous 3 months.

Article 35: Telecommunications users should pay the full amount of the telecommunications charges to the telecommunications carrier at the agreed time and by the agreed means. If a telecommunications user fails to pay telecommunications charges within the agreed payment time, the telecommunications carrier has the right to request the user to pay the amount due and collect a penalty of 0.3% on the balance due for every delayed day.

If the telecommunications user fails to pay the telecommunications charges 30 days after the agreed date of payment, the telecommunications carrier can suspend telecommunications services. If a telecommunications user fails to pay the telecommunications charges and the penalty within 60 days after the suspension of telecommunications service, the telecommunications carrier has the right to terminate the services provided to the user and to pursue the payment due as well as the penalty.

An operator of mobile telecommunications services can negotiate with telecommunications users about the time limit and the means of paying the telecommunications service charge. This is not limited by the above provision.

The telecommunications carrier should resume the suspended telecommunications service within 48 hours after receiving the delayed telecommunications charges and fines from the telecommunications users.

Article 36: When the engineering, construction or network building affects or may affect the telecommunications services, telecommunications carriers should notify the telecommunications users in due time and report to the telecommunications administration in charge. In this case, the telecommunications carrier should make reductions or remissions for any relevant charges accordingly during the period of suspension.

If a telecommunications carrier fails to notify users in time, then the telecommunications carrier should compensate the users for any losses thus incurred.

Article 37: The telecommunications carrier of local telephone services and mobile phone services should provide toll-free telecommunications services to the public for such things as fire, police, medical aid and traffic accidents etc. and ensure the smooth transmission of these telecommunications.

Article 38: The telecommunications carrier should provide timely and reasonable access service to group users who need access to its telecommunications network via the backbone. A telecommunications carrier is not allowed to terminate access service without approval.

Article 39: Telecommunications carriers should set up a system for internal service quality control and develop an enterprise standard of telecommunications services that is higher than the state standard. The standard should be published.

The telecommunications carrier should listen to telecommunications users' opinions and accept social supervision in order to improve the quality of their telecommunications services.

Article 40: When telecommunications services provided by a telecommunications carrier are not up to the state standard or the published enterprise standard for telecommunications services, or when telecommunications users disagree with the telecommunications fees, users have the right to request that the telecommunications carrier solve the issue. If the telecommunications carrier refuses to solve the issue or the telecommunications users are not satisfied with the solution, telecommunications users have the right to petition the MII or the telecommunications administration of province, autonomous region and municipality directly under the central government, or other relative administrations. The administration receiving the petition must dispose of the petition and make a reply within 30 days after receiving the petition. When the telecommunications user disagrees with the local telephone bill, the telecommunications carrier must provide the billing how-to and take all necessary steps in cooperating with the telecommunications users to uncover the cause.

Article 41: A telecommunications carrier is not allowed to:

1. set limits of any form or require telecommunications users to choose their prescribed service
2. request that telecommunications users purchase their prescribed telecommunications terminal devices or reject licensed telecommunications terminal devices prepared by the telecommunications users themselves
3. make unapproved alterations or alterate in disguise the standard rate or add to the items charged that violate the regulation
4. refuse, delay or terminate telecommunications services to telecommunications users without proper reason
5. fail to fulfill the promise made to telecommunications users publicly or make misleading and untrue advertisements
6. use wrongful means to create hindrances for telecommunications users or get revenge on users' complaints.

Article 42: A telecommunications carrier is not allowed to:

1. restrict a telecommunications users choice to choose lawful telecommunications service provided by other telecommunications carriers

2. give unreasonable cross-subsidy to different services it engages in
3. provide telecommunications services at rates lower than set costs and adopt unfair means in competition.

Article 43: The MII or the telecommunications administration of a province, autonomous region and municipality directly under the central government shall oversee and inspect the quality and operational activities of telecommunications services provided by the telecommunications carrier and the inspection results should be published.

Article 44: The telecommunications carrier must carry out a universal service duty. The universal service duty borne by the telecommunications carriers shall be determined by the MII by means of either designation or bidding. The Measures of Compensation for Universal Telecommunications Service Cost will be established by the MII in conjunction with the Financial Department and Price Department of the State Council. After being approved by the State Council, the Measures will be enacted.

SECTION FOUR: TELECOMMUNICATIONS CONSTRUCTION (omitted)

SECTION FIVE: TELECOMMUNICATIONS SECURITY

Article 57: No entity or individual is allowed to employ telecommunications networks to make, copy, publish or spread information with content that:

1. runs opposite to the basic principles fixed by the Constitution
2. harasses national security, leaks the country's secrets, overthrows the government or hurts national unification
3. harms the reputation and benefits of China
4. agitates ethnic hatred and discrimination or harms national unity
5. harms the government's religious policy or advocates cults and feudal superstition
6. spreads rumors, disturbs public order and social stability
7. spreads pornography, obscenity, gambling, violence, killing, terror or instigates crime
8. insults or slanders others and thus infringes the legitimate rights of others
9. other contents that are forbidden by laws and decrees.

Article 58: No entity or individual is allowed to engage in the following activities that harm the telecommunications network security and/or information security:

1. deletion of or modification of functions of the telecommunications network or data and application programs stored, processed and transmitted over telecommunications networks
2. stealing or damaging other people's information and harming their lawful rights by employing telecommunications networks
3. deliberate creation, copy and transmission of computer viruses or using other means to attack another's telecommunications network or equipment etc.
4. other activities harming the telecommunications network security and information security.

Article 59: No entity or individual is allowed to engage in the following activities that disturb the order of the telecommunications market:

1. renting dedicated international telecommunications lines or linking switching equipment; engaging in business operations of international telecommunications services or telecommunications services to Hong Kong, Macao and Taiwan without the proper approval
2. unlawful linking to others' telecommunications lines, copying others' telecommunications numbers and knowingly using the unlawfully linked equipment or copied number
3. forging or making an alteration of a telephone card and other telecommunications service value vouchers
4. using false ID cards or assuming another's ID to go through the formality for accessing the mobile network and using a mobile phone.

Article 60: Telecommunications carriers should establish internal security control system in accordance with relevant state rules.

Article 61: The design, construction and building of telecommunications networks and telecommunications carriers should correspond with national security requirements and telecommunications network security and be in accordance with the state's plans, constructions and operations.

Article 62: Upon finding that any information transmitted over a telecommunications network obviously belongs to the scope of Article 57, the telecommunications carrier should immediately stop the transmission, keep the relative records and report to the relevant government departments.

Article 63: Telecommunications users are responsible for the contents of information transmitted over telecommunications networks as well as any consequences caused by that information. If the information transmitted over the telecommunications networks is confidential information of the state, then the telecommunications user must take protective measures according to state law.

Article 64: During urgent situations such as a serious natural disaster, the MII has the right to acquire various telecommunications facilities to ensure the unblocked transmission of important communications.

Article 65: Foreign entities engaging in China's telecommunications services must be approved by the MII through the International Communications Bureau. This regulation also applies to communications between Mainland China and Hong Kong SAR, Macao SAR and Taiwan.

Article 66: law protects the freedom of lawful utilization of telecommunications and the telecommunication user's communication privacy. No entity or individual has the right to inspect the content of telecommunications for any reason except for the Public Security Administration, National Security Administration or the People's Procuratorate, who may inspect the content of telecommunications according to the procedures prescribed by law.

The telecommunications carrier and its working staff are not allowed to provide the content of information transmitted by telecommunications users over telecommunications networks to any other party without authorization.

SECTION SIX: PENALTY (omitted)

SECTION SEVEN: APPENDIX

Article 80: The State Council will develop a detailed procedure for investment and engagement of foreign entities or individuals in China's telecommunications services, Hong Kong SAR, Macao SAR and Taiwan. Individual investment and engagement of telecommunications services in Mainland China is also subject to the same procedure.

ATTACHMENT: TELECOMMUNICATIONS SERVICES CATEGORY

1. Basic telecommunications services
 1. domestic local telephone and long-distance telephone over fixed networks
 2. telephone service and data service over mobile networks
 3. satellite communications and satellite mobile communications service
 4. Internet and other public data transmission services
 5. rent and sale of bandwidth, wave length, fiber optics, cable optics, channel and other network elements
 6. service of network carrying, access and outsourcing etc.
 7. International telecommunications infrastructure and International telecommunications services
 8. wireless paging
 9. re-sold basic telecommunications serviced Management of item (8) and (9) refers to the provisions for value-added telecommunications services
2. Value-added telecommunications services
 1. e-mail
 2. voice mail
 3. online information storage and sorting
 4. electronic data exchange
 5. online procession of data and transaction
 6. value-added fax
 7. internet access service
 8. internet information service
 9. visual telephone conference services.

Bibliographical Notes

¹ Chase Manhattan and Citibank are hiring Chinese software developers for offshore programming. According to one software productivity consultant, the development costs per unit of software in the United States run about \$1,000.00 versus about \$150.00 in China. See the edition of the November 11, 1999, Market Newspaper: Five Trends In China's Telecom Market (11/16/99).

² Key Indicators for the First Quarter 1998: GDP Growth 7%, Retail Price Index: -1.5%; Consumer Price Index: 0.3%; Fixed-asset Investment: 10.3%; Value-added Industrial Output: 8.2%; SOE and Collective Output: 3.3%; Foreign and Shareholding Firm Output: 12.3%; Foreign Exchange Reserves: \$140.6 billion. Figures compared to first quarter 1997, Source: Dow Jones News Service, PRC State Statistical Bureau

³ Although that averages out to just 6.3 lines for every 100 people in 1996 (compared with 40 to 50 lines per person in developed countries).

⁴ Jichuan, Wu, Minister of Posts and Telecommunications of the PRC "Developing a Telecommunications Industry with Chinese Characters" speech delivered at Texas A&M University on Dec 4 1997, www.china-embassy.org/cgi-bin/press.pl?telspeech.:

⁵ <http://www.igigroup.com/st/summary/sumchinav5.html>

⁶ Individual cities are caught up in the rush, too; they reveal their own aspirations in China's telecommunications future. "In four years, we will have a telephone network rivaling Hong Kong's," promises Zhang Cheng He, director of Office Affairs, Shanghai PTA.

⁷ Up to July 2000, while the telecommunications equipment business has already become one of the most open and competitive markets in China; no foreign ownership is allowed in the letter business.

⁸ Chinese-Chinese-Foreign (CCF) financing structures were created by Unicom in 1994 to circumvent China's long-standing prohibition on foreign ownership, operation and management of telecommunications enterprises. "With CCF, a Build-Transfer-Operate (BTO) or Build-Lease-Service (BLS) finance and management arrangement is implemented. A Chinese company licensed to operate a network such as a local Unicom branch creates a joint venture that serves as an investment-clearing house. Complex 3-way management contracts between the operator (Chinese), joint venture company (Chinese), and investor (Foreign) combine equipment leasing, royalties, consulting and license fees in a network supply contract in lieu of direct equity investment. 44 CCF contracts with local Unicom contracts have been signed, of which about 20 are active. Major Partners include Bell Canada, France Telecom and Sprint." For more indications, see Ken Zita, January 17, 1998, Foreign Equity in Telecoms Hangs in the Balance, Pacific Telecommunications Council (PTC) Honolulu, HI - Copyright © 1999 Seattle Times Company Posted at 06:16 a.m. PDT; Tuesday, September 14, 1999.

⁹ ChangAn had formed a joint venture (JV) with LTC West-link, a unit of Singaporean steel and property company Lion Teck. LTC West-link held a 38 percent share in the JV. According to Reuters, the joint venture was formed to invest in China Unicom's GSM (global system for mobile communications) network in Xi'an, Shaanxi Province. Refer to an August 11 report in *Shanghai Securities News* and for more information see related story in "China Unicom Terminating Ties with CCF Partners," Vol. 1, No. 31, PRC - Information Technology Review, August 13, 1999 and also <http://www.woodmedia.com/cinfolink/dimhopes.html>.

¹⁰ On December 13, 1999, during the WTO China-US negotiations, MII's Wu Jichuan reminds also foreign firms on other remaining issues, like the current conflict between China Unicom and former partners that tried to enter the Chinese telecommunication by using a backdoor construction. Wu also said China would impose a licensing regime on ICPs. Aides to Wu Jichuan dashed hopes the WTO agreement offered a resolution for foreign telecommunications companies who have been ordered to withdraw \$1.4 billion of investments in Chinese networks. "Since these projects are in violation of existing policies, we need to correct them immediately," the Wall Street Journal quoted Dai Shuang, head of the information ministry's General Planning Department, as saying. "WTO does not change this at all," Dai said.

¹¹ China Telecom Monopoly Ends, Reuters, 20 April, 2000

¹² According to the South China Morning Post, China Telecom already has submitted its proposal to the MII and the State Development Planning Commission, with public hearings to be held in August. The paper added that the company's rate changes are expected to take effect by the end of this year. See Morning Dispatch, Shanghai Daily News, July 18, 2000.

¹³ Since 1998, Qualcomm, the San Diego based company, USA, has been on the roll-coaster with the China Government while trying to counter the adaptation and the extension of GSM technology for cellular market in China and Asia. See "Qualcomm battling for foothold in China," San Diego-based telecommunications firm Qualcomm Inc is lobbying Beijing to adopt a U.S. cellular standard in an effort to take market share from entrenched European mobile phone companies. "China is the number one battleground, and will be the most important market," said Martin Chang, the company's regional director for China said on Wednesday. Mercury Center, 10/28/98.

¹⁴ Li Xiaodong: China's Telecommunications: Policy Characteristics and Foreign Investment, November 1998, IREX.

¹⁵ See more details in <http://www.woodmedia.com/cinfolink/dimhopes.html>

¹⁶ According to Rikizo Yamada, director of the Beijing liaison office for Kokusai Denshin Denwa Co. Ltd. (KDD, Japan).

¹⁷ Until 1998, according to Wu Jichuan, Minister of Posts and Telecommunications, China has no intention of opening its closely guarded telecommunications service sector to foreigners in the near future.

¹⁸ Refer to Jichuan, Wu. "Developing a Telecommunications Industry with Chinese Characters" Op. Cit.

¹⁹ For more details on foreign ownership of China Telecom, See Reuters: 02/24/2000, EU Angles for Telecom Prize in China WTO Talks.

²⁰ China Telecom Monopoly Ends, Reuters Apr. 20, 2000.

²¹ Matt Pottinger: March 3, 2000, "Lucent Wins \$100 Million in China Deals" Beijing, Reuters.

²² Since 1996, the Government has allowed the sale of handsets through independent distributors and retailers. Motorola phones are available in 10,000 outlets; Nokia will open 500 franchised shops within 18 months. The handset market is dominated by the "three horses", as the Chinese call Ericsson, Motorola and Nokia. In 1999, China became the largest market in the world for Ericsson, and it ranks second (after the US) for Motorola and Nokia. See By Andrew Tanzer: "Telecommunications: China mobilizes, and foreigners hear the call," August 13, 1999, Forbes.

²³ In addition to the Motorola's mistake, another US based company, Qualcomm has been since 1998 on the roll-coaster with the China Government and trying to counter the adaptation of GSM technology and the extension of European companies in the local cellular market. See

“Qualcomm battling for foothold in China,” San Diego-based telecommunications firm Qualcomm Inc is lobbying Beijing to adopt a U.S. cellular standard in an effort to take market share from entrenched European mobile phone companies. “China is the number one battleground, and will be the most important market,” said Martin Chang, the company's regional director for China said on Wednesday. Mercury Center, 10/28/98. Refer also to Ray Tsuchiyama: The Cellular Industry in China: Politics, Rewards, and Risks, 6 January 1999, Business Insight Japan.

²⁴ <http://www.igigroup.com/st/summary/sumchinav5.html>.

²⁵ Based on reports of multiple users sharing single accounts, the actual figures are probably higher, See Emarketer: Wednesday, 12 January 2000, Chi-2K: eBusiness Behind the Great Wall.

²⁶ In regards to television and radio services, the Chinese Communist Party strictly regulates all forms of media. The state owns and runs all television and radio stations. In addition to national TV and radio stations, all provinces have their own stations. Whereas the national television stations are under the control of the Communist Party, the regional stations wield more autonomy in terms of their programming rights. Since China has the World's largest TV viewing audience, it has thousands of registered receiving stations that enable viewers to see programs transmitted from Beijing as well as from foreign countries. Since some Chinese have recorded foreign programs for resale on video, the government began to regulate the number of foreign programs beamed down from foreign satellites. As a result, the 600 plus cable TV operators have been banned from broadcasting foreign-satellite television programs. See also the Ministry of Information Industry, See Emarketer: Wednesday, 12 January 2000, Chi-2K: eBusiness Behind the Great Wall.

²⁷ According to the market research collective, The New Century Group and China National Network Information Center (CNNIC), July 2000.

²⁸ Peter Lovelock: October 29, 1999 E-China: Putting Business on the Internet, Maverick Research. See also “The Intel chip market in China has already exceeded Germany, and that only represents 1.8 percent of the population.” From Hong’s Kong, Q&A with Richard Li by Sarah Lai Stirland, Red Herring, June 2000.

²⁹ Reported by the Yue Gang Xinxu Bao (GD-HK Information Daily) Aug. 24, 2000.

³⁰ MeetChina.com, a cross-border E-commerce service provider, is working with US-based Kinzan.com to enable Chinese merchants to make direct web-based sales in global markets. The service, which will be made available in the first quarter of 2000, will allow small business merchants to create their own web storefronts and enable them to make direct online transactions with overseas businesses. ChinaMallUSA.com Inc., a Business-to-Business E-commerce company, signed agreements to provide E-commerce web sites to two Chinese cities. But, despite the lack of standard electronic payment systems, companies and individuals continue to do business electronically. Netease's auction community supports 12 types of online payment, including credit cards and bankbooks. Dell Computer takes orders over the Internet, accepts payment via wire transfer, and then ships the merchandise afterwards. China Post's Express Mail Service will provide COD service to merchants for a commission.

³¹ Introductory notes of “China Telecom 2000: Vol. 5, Data Market and Opportunities,” Igi group.

³² Other requirements include: Possess a corresponding network, and technical and management personnel; Incorporate a sound system for control of security and confidentiality; Satisfy other legal regulations of the State council.

³³ This notice covers all people and networks that directly or indirectly connect to the Internet, and includes people in Hong Kong, Macao and Taiwan. The notice requires filing of a list of all users

(for network controllers), or their own identification (for individuals), as well as the network connection approval documents. The filing must be lodged with the local designated public security organs (i.e. the police) within 30 days of the official connection to the network. Whether this refers to the same date as the actual connection to the network is unknown. Either way, these obligations are particularly burdensome for information technology and networking businesses in China.

³⁴ Such an arrangement is similar to Australian ISPs, which connect to the Internet through TELSTRA. Using the Chinese definitions, TELSTRA is an Interconnected Network and the ISPs are Connected Networks.

³⁵ By Reuters Special to CNET News.com, February 1, 2000 and Oct 4, 2000.

³⁶ See Sarah Lai Stirland, Red Herring, June 2000: op. cit.

³⁷ See China Economic Information, 07/25/97 and according to statistics from the Ministry of Foreign Economic Relations and Trade.

³⁸ “Observers have questioned the ability of the Chinese educational system to provide its graduates with the kind of creative mindset that would enable Chinese companies to leap into another league. The most popular pedagogical approach is still “force-feeding of the duck” and rote learning. Chinese tradition and teaching methods simply do not encourage creative, independent thinking. With the fixation on quick economic results, the educational sector has been overlooked, leading to a crisis at universities, where for a few years there were almost no takers for post-graduate research posts, for instance.” For more details, see: Göran Leijonhufvud & Ulf Berglund: March 1998, Market China, in Ericsson Connexion no.1.

³⁸ For more details on foreign ownership of China Telecommunications, See EU Angles for Telecom Prize in China WTO Talks, 02/24/2000, Reuters.

³⁹ China's economy has grown at an average of 10% annually since Deng Xiaoping initiated market reforms in 1980 and its inflation rate has recently been brought down below 12%. Fear of the economy overheating and rising inflation rates, which happened in the late 1980s and early 1990s, have persuaded some foreign companies to take a wait and see attitude with regards to further telecommunications investments.

⁴⁰ Over 200 McDonald's restaurants in 17 cities by 1999, see *The Cellular Industry in China: Politics, Rewards, and Risks* by Ray Tsuchiyama, Pacific Telecommunications Council, Copyright 1999.

⁴¹ “Observers have questioned the ability of the Chinese educational system to provide its graduates with the kind of creative mindset that would enable Chinese companies to leap into another league. The most popular pedagogical approach is still “force-feeding of the duck” and rote learning. Chinese tradition and teaching methods simply do not encourage creative, independent thinking. With the fixation on quick economic results, the educational sector has been overlooked, leading to a crisis at universities, where for a few years there were almost no takers for post-graduate research posts, for instance.” For more details, see: Göran Leijonhufvud & Ulf Berglund: March 1998, Market China, in Ericsson Connexion no.1.