

The Pennsylvania State University

The Graduate School

College of Communications

**CHINA'S TELECOMMUNICATIONS: ACCOMPLISHMENTS, PROBLEMS  
AND THE SHAPE OF THE FUTURE TO COME**

A Thesis in

Mass Communications

by

Chun Liu

© 2006 Chun Liu

Submitted in Partial Fulfillment  
of the Requirements  
for the Degree of

Doctor of Philosophy

December 2006

The thesis of Chun Liu was reviewed and approved\* by the following:

Richard D. Taylor  
Palmer Chair Professor of Telecommunications Studies and Law  
Thesis Advisor  
Chair of Committee

Jorge R. Schement  
Distinguished Professor of Communications

Krishna Jayakar  
Associate Professor of Communications

Jun Shu  
Assistant Professor of Supply Chain and Information System

John S. Nichols  
Professor of Communications  
Associate Dean for Graduate Studies and Research

\*Signatures are on file in the Graduate School

## ABSTRACT

There is little doubt that China's telecommunication service is now fairly affordable, very fashionable, and highly dynamic. In terms of market structure, although it is not perfect, the Chinese government has preliminarily created a competitive market structure. In each sector, theoretically, there are at least two carriers competing with each other. With regard to the regulatory regime, despite its complicated, if not mystic, policy-making process, telecommunication regulation is probably the most open policy issue in China. A regulatory agency has been set up after several government restructurings. Relevant laws and regulations are in place and are kept updated. Overall, China's success has made it the envy of many developing countries.

China's telecommunications are unique. China's achievement in telecommunications should be partly attributed to the old socialist economic system. The Chinese government designed the roadmap of the great reform and carefully implemented the plan of restructuring the industry and the regulatory regime, hoping to bring healthy competition into the market. Although it is open to debate whether this kind of managed reform is efficient or not, there is no doubt that, without the Chinese government's strong and continuous support, China's telecommunications could not possibly have achieved today's success.

At issue is whether China's telecommunications development is sustainable in the future. The primary purpose of this study is to find out what regulatory approach the Chinese government should take to further advance China's telecommunications service industry in the coming decade. More importantly, the regulatory model proposed in this

study aims to retain the sustainability of China's telecommunications industry. However, without understanding its history, any inquiry into the future is superficial. A great deal of this study is to understand what "Chinese characteristics" are and how they have shaped China's telecommunications.

The primary finding of this research is the identification of the objectives of China's telecommunications policy: namely expanding telecommunications to serve the public interest and strengthening domestic carriers in the face of global competition. The consistent support from the government has helped China's telecommunications industry successfully leapfrog to a relatively modern stage and potentially take the lead in some areas in the future. However, the ability of the current model of regulation to secure long term sustainability is questionable. This thesis also finds that that the combination of the "silo" type of regulation, the conflict of national and local interests and the dominance of state ownership are the key "Chinese characteristics". However, it should be noted that "Chinese characteristic" is an evolving concept. Any policy measures that are in accord with the objectives of the Chinese government can be branded as "Chinese characteristics". A model is proposed aiming to resolve issues identified in line with the Chinese government's long term policy objectives.

## TABLE OF CONTENTS

LIST OF FIGURES .....	x
LIST OF TABLES .....	xii
ACKNOWLEDGEMENTS .....	xiii
<b>Chapter 1 INTRODUCTION</b> .....	<b>1</b>
1.1 An Overview of China’s Telecommunications .....	1
1.2 Research Questions.....	4
1.3 Organization of the Dissertation.....	6
<b>Chapter 2 SURVEY OF LITERATURE</b> .....	<b>9</b>
2.1 Regulation and Deregulation Theories .....	9
2.1.1 In the Name of the “Public Interest” .....	10
2.1.2 The Theory of Regulatory Contract and New Institutional Economics .....	13
2.1.2.1 Regulatory Contract .....	13
2.1.2.2 New Institutional Economics .....	15
2.1.2.3 Application of the Regulatory Contract Theory to China .....	17
2.1.3 Deregulation for “Development” .....	18
2.1.4 The Objectives of China’s Telecommunications Regulation and Deregulation .....	21
2.2 Chinese Characteristics.....	23
2.2.1 Socialism with Chinese Characteristics.....	24
2.2.1.1 Deng Xiaopin’s Theory .....	24
2.2.1.2 Jiang Zheming’s Three Representatives.....	27
2.2.1.3 Harmonious Society and Healthy GDP.....	27
2.2.2 Telecommunications with Chinese Characteristics.....	28
2.3 Regulatory Models.....	29
2.3.1 The “Silo” Model .....	29
2.3.2 The Layered Model .....	31
2.3.2.1 The Problems of the Silo model.....	31
2.3.2.2 Theoretical Foundation for the “Layered model” .....	32
2.3.2.3 Benefit of the Layered Model .....	33
2.3.2.4 Design of the Layered Model.....	33
2.3.2.5 Current Implementation of the Layered Model.....	35
2.3.2.6 Critics of the Layered Model .....	37

2.3.3	Anti-Trust and Competition Law Model .....	38
<b>Chapter 3</b>	<b>METHODOLOGY .....</b>	<b>41</b>
3.1	The Overall Approach and Rationale .....	41
3.1.1	Interpretive Paradigm .....	41
3.1.2	Exploratory Approach .....	42
3.2	Research Design .....	43
3.2.1	Case study.....	43
3.2.2	Collection and Analysis of Data.....	46
3.2.2.1	Collection of Data .....	46
3.2.2.2	Analysis of the Data .....	47
3.3	Limitations and Exclusions.....	48
<b>Chapter 4</b>	<b>OVERVIEW OF CHINA’S MODERN TELECOMMUNICATIONS: HISTORY AND CURRENT DEVELOPMENT .....</b>	<b>50</b>
4.1	From “Lightning Wires” to “Information Super Highway” .....	50
4.1.1	The Introduction of the Telegraph.....	50
4.1.2	1949 to 1980: Slow Progress.....	52
4.1.3	Prepare for Take-off: 1981 to 1990 .....	54
4.1.4	The Great Leapfrog: since the 1990s.....	56
4.1.4.1	Restructuring the Telecommunications Industry .....	57
4.1.4.2	Restructuring the Regulatory Regime .....	59
4.1.5	The Information Superhighway.....	62
4.1.5.1	Infrastructure .....	62
4.1.5.2	Services .....	64
4.2	Overview of China’s Modern Telecommunications.....	65
4.2.1	Market Structure.....	65
4.2.2	The Regulatory Regime.....	68
4.2.2.1	The Chinese Communist Party: the Super Power .....	68
4.2.2.2	The National People’s Congress: the Legislative Body.....	68
4.2.2.3	The State Council: the Executive Body .....	69
4.2.2.4	Ministries and Commissions .....	70
4.2.3	Formal Legislation on Telecommunications .....	72
4.2.4	Other Institutions .....	73
4.2.4.1	Interested Parties and Public Opinion .....	73
4.2.4.2	International Institutions .....	75
4.2.5	Regulatory Model.....	75
4.3	Analytical model.....	77
4.4	Concluding Remarks .....	79

<b>Chapter 5 PHS: WIRELESS ENJOYMENT AT A WIRELINE PRICE .....</b>	<b>82</b>
5.1 Introduction.....	82
5.2 What is PHS?.....	84
5.3 The Mystery of the Rise and Fall of PHS in China .....	86
5.3.1 Slow Progress at the Beginning.....	86
5.3.2 Rapid but Risky Development from 2000 to 2002.....	89
5.3.3 No encouragement, No intervention.....	94
5.3.4 Prospects.....	97
5.4 Lessons Learned .....	99
5.4.1 Decentralized Structure .....	100
5.4.2 Silo Model .....	101
5.4.3 Balance Seeking .....	102
5.5 Concluding Remarks .....	102
<b>Chapter 6 IPTV: CONVERGENCE OF CABLE AND TELEPHONE .....</b>	<b>104</b>
6.1 Introduction.....	104
6.2 What is IPTV? .....	105
6.3 IPTV in China.....	107
6.3.1 Market Development .....	107
6.3.1.1 The IPTV “Gold Rush”: 2004 .....	108
6.3.1.2 The SARFT Reclaiming Control.....	110
6.3.2 China’s IPTV Regulations.....	111
6.3.2.1 Regulation of China’s Cable Industry: An Historical Review ..	111
6.3.2.2 IPTV Regulation .....	113
6.4 Issues and Prospects .....	116
6.4.1 IPTV vs. Digital TV .....	116
6.4.2 Content .....	119
6.4.3 Propaganda .....	120
6.5 Concluding Remarks .....	121
<b>Chapter 7 3G: MADE IN CHINA .....</b>	<b>123</b>
7.1 Introduction.....	123
7.2 Overview of 3G Standards.....	125
7.3 Standards Setting In China: Stakeholders and Their .....	127
7.3.1 The Chinese Government .....	128
7.3.2 Telecommunications Operators.....	130
7.3.3 The Manufacturers.....	131
7.4 Standards Setting With Chinese Characteristics.....	133
7.4.1 Some Precedents in Standards Setting .....	133

7.4.1.1	The Choosing Of GSM .....	133
7.4.1.2	Unicom’s “New Horizon”: CDMA.....	134
7.4.1.3	China Telecom’s PHS .....	134
7.4.2	3G: A Prolonged Process.....	135
7.5	Prospects .....	140
7.5.1	Balance seeking .....	140
7.5.2	Who Is Captured? .....	141
7.5.3	Another PHS?.....	142
7.6	Concluding Remarks .....	143
Chapter 8	THE FUTURE OF CHINA’S TELECOMMUNICATIONS: RESTRUCTURING THE REGULATORY REGIME.....	145
8.1	A Brief Summary of the Cases Studied.....	145
8.2	Problems and Issues of the Current Market and Regulatory Structures .....	146
8.2.1	The Current Regulatory Model Refined.....	146
8.2.2	Issues .....	147
8.2.2.1	Vertical Separation: the “Silo” Approach .....	148
8.2.2.2	Horizontal Disconnection: Tensions between National and Local Interests .....	150
8.2.2.3	The Regulatory Regime .....	153
8.3	Toward a New Regulatory Model .....	156
8.3.1	The Objectives of China’s Telecommunications Reform .....	156
8.3.2	Proposals for Further Development.....	157
8.3.2.1	The Applicability of International Experiences .....	157
8.3.2.2	The New Paradigm of China’s Telecommunications: Principles.....	159
8.3.2.3	Towards the New Regulatory and Market Structure: A Step- by-step Policy Recommendation.....	162
8.4	Concluding Remarks .....	166
Chapter 9	CONCLUSIONS.....	168
9.1	An Overview.....	168
9.2	The Shapes of the Future .....	170
9.2.1	Ownership.....	170
9.2.2	Independent Regulator.....	171
9.2.3	Regulatory Theory.....	172
9.2.4	Regulatory Agencies .....	173
9.2.5	Regulatory Process.....	173
9.2.6	Competitive Market Structure .....	175

9.2.7 Legislation .....	176
9.2.8 Public Interest .....	177
9.2.9 Universal Service.....	177
9.2.10 Internet Regulation .....	178
9.2.11 Interconnection .....	179
9.3 Summary.....	180
Bibliography .....	183

## LIST OF FIGURES

Figure <b>2-1</b> : Double-necked hourglass layered model proposed by Werbach .....	35
Figure <b>4-1</b> : Major public telecommunications operators in China*** .....	59
Figure <b>4-2</b> : Evolution of China’s Telecommunications Regulatory Regime .....	61
Source: State Statistical Bureau, China (State Statistical Bureau,2005) .....	63
Figure <b>4-3</b> : Development of Communications Capacity .....	63
Figure <b>4-4</b> : Number of Subscribers.....	65
Figure <b>4-5</b> : Current Regulatory Model .....	77
Figure <b>4-6</b> : Analytical Framework.....	78
Figure <b>5-1</b> : An Example of PHS Network Design.....	85
Figure <b>5-2</b> : Operating Revenue of Major Chinese Telecommunications Carriers (2000-2002) Source: MII Statistical Report 2001, 2002, 2003 .....	90
Figure <b>5-3</b> : The Number of Wireless and Wireline Subscribers (2000-2002) Source: MII Statistical Report 2001, 2002, 2003 .....	90
Figure <b>5-4</b> : Market Share of Major Chinese Carriers, by the Number of Subscribers (in Percentage), 2003. Source: MII (Ministry of Information Industry, 2004 .....	95
Figure <b>5-5</b> : Telecommunications Revenue, by the type of service (in percentage), 2003. Source: MII (Ministry of Information Industry, 2004 .....	95
Figure <b>5-6</b> : New Subscribers of Wireline Service (2005) .....	98
Figure <b>5-7</b> : Modified Analytical Framework for PHS.....	100
Figure <b>6-1</b> : IPTV Platform.....	107
Figure <b>6-2</b> : Framework of IPTV Regulation.....	114
Figure <b>7-1</b> : Major 3G Standards .....	125
Figure <b>7-2</b> : Migration Path to 3G.....	126

Figure 7-3: 3G Standards Setting in China .....	136
Figure 8-1: The Market Structure and Regulatory Regime of the Chinese Telecommunications Service Industry .....	147
Figure 8-2: Shareholder Structure of China's Major Telecommunications Carriers .....	155
Figure 8-3: A Proposed Model for China's Telecommunications.....	166

**LIST OF TABLES**

Table 4-1: Growth of China's Telecommunications Industry, 1976-1980.....	53
Table 4-2: Selected Responsibilities of the MII .....	60
Table 4-3: Key Indicators of Telecommunications Capacity as of 2005.....	63
Table 4-4: T Market Structure of China's Telecommunication Industry .....	66
Table 7-1: 3G Spectrum Allocations in China.....	137
Table 8-1: An Illustration of the Telecommunications Service Plan in Chengdu City .....	151

## ACKNOWLEDGEMENTS

First and foremost, I'm greatly indebted to my Chair, Dr. Richard D. Taylor, for his guidance of my doctoral thesis. Prof. Taylor has constantly provided guidance, knowledge, caring, support, patience, and personal encouragement that are of great help to me throughout my entire doctoral program. He helped me finish my first policy research paper after my 8 years of engineering training and career, during which I never wrote an article more than 5 pages. He has suffered with me through many drafts and agonies with equanimity, close reading insightful suggestions. In addition, few graduate students in our college would question that Dr. Taylor is one of the most generous advisors that we could possibly have. I feel fortunate and honored to be one of his students. He will always remain a significant model to be emulated in guiding my future career.

My gratitude also goes to Prof. Jorge R. Schement, who taught me a great deal about structuring my thoughts and presenting them to others. His insightful thoughts and comments have been very helpful to my research in many policy issues. Personally, he makes me feel like a member of his family. The close friendship we have established is the kind that I deeply appreciate from the bottom of my heart. I want to express my appreciations my committee members, Dr. Krishna and Dr. Jun Shu, who have offered me plenty of assistance and suggestions during the period of my thesis writing. I benefited greatly from their brilliant intellect and expertise.

I want to dedicate my dissertation to my parents, parents-in-law and wife. They helped me to stay motivated throughout the years of my studying in the United States. Their endless love, support, and encouragement indeed made this dissertation possible. Particularly, since I am the only child, my wife, Dongni Shen, has been taking very good care of my family in my absence. She has become my emotional support all these years. She is my next of kin and has been the closest to me since I spent the last 4 years in this country alone and away from my parents. I hope they will be proud and possibly, relieved, to see the diploma I will bring back to them.

## Chapter 1

### INTRODUCTION

#### 1.1 An Overview of China's Telecommunications

Since 1978, when the Chinese government decided to open China to the rest of the world, China's economy has experienced significant growth. Driven by explosively growing demand resulting from economic reforms and developments, favorable policies from both central and local governments and advancement of new technologies, China's telecommunications service industry has experienced extraordinary development (Yunqian Chen, 1993). As of January 2006, China had 353 million wireline and 399 million wireless subscribers<sup>1</sup>, ranking first in the world. In 25 years, the telephone penetration jumped from 1978's 0.2 telephone mainlines in use per 100 inhabitants to 2004's 24.9<sup>2</sup>. It is hard to find any non-telephone household in urban areas nowadays. Moreover, quality of service has improved dramatically. The Chinese carriers keep pushing new services and features into the market. Price has been continuously dropping over recent years. There is little doubt that China's telecommunication service is fairly affordable, very fashionable, and highly dynamic. In terms of market structure, although it is not perfect, the Chinese government has preliminarily created a competitive market

---

<sup>1</sup> As of January 2006, according to the monthly subscriber data of the Ministry of Information Industry retrieved from: [http://www.mii.gov.cn/art/2006/02/24/art\\_166\\_6928.html](http://www.mii.gov.cn/art/2006/02/24/art_166_6928.html).

<sup>2</sup> Data was retrieved from the World Telecommunication Indicators database of the International Telecommunication Union.

structure. In each sector, theoretically, there are at least two carriers competing with each other. With regard to the regulatory regime, despite its complicated, if not mystic, policy-making process, telecommunication regulation is probably the most open policy issue in China. A regulatory agency has been set up after several government restructurings. Relevant laws and regulations are in place and are kept updated. Overall, China's success has made it the envy of many developing countries.

China's telecommunications are unique. China's achievement in telecommunications should be partly attributed to the old socialist economic system. "Privatization" has never been a keyword in China's telecommunications reform. The Chinese government designed the roadmap of the great reform and carefully implemented the plan of restructuring the industry and the regulatory regime, hoping to bring healthy competition into the market. Although it is open to debate whether this kind of managed reform is efficient or not, there is no doubt that, without the Chinese government's strong and continuous support, China's telecommunications could not possibly have achieved today's success. In addition, contrary to the common wisdom that foreign direct investment is one of the most significant driving forces for the development of telecommunications in developing countries, China's telecommunications service industry largely relies on domestic funding. The Chinese government had firmly prohibited foreign investment in the telecommunications service industry before 2001. Any attempt to circumvent the ban during that period was uncompromisingly blocked. Foreign telecommunications carriers were portrayed as "wolves" in China. People were afraid that, if the door was opened, foreigners would have swept away domestic carriers as was observed in South American countries. Later,

foreign investors were able to purchase major Chinese carriers' stock in the New York and Hong Kong Exchanges. However, the proportion available to them was very small.

At issue is whether China's telecommunications development is sustainable in the future. Domestically, after 20 years of explosive expansion, for the first time, the Chinese carriers, including the most lucrative cellular sector, are now facing single digit growth. Still, millions of new subscribers are signing up every year, but the profit margin keeps decreasing. Although competition looks furious among carriers, the market mechanism, as correctly criticized by many scholars, is often dysfunctional. The regulator has not been able to catch up with the market and technology. Regulation is inefficient, if not anti-competitive, in many cases. Internationally, foreign investors seem to be cautious rather than enthusiastic after China finally opened its basic telecommunications market on December 11, 2004 under its commitment to the WTO. China now allows foreign investors to set up joint ventures in basic telecommunication services. Initially, the share of foreign capital is set at a 25 percent cap and their operations are limited to three major cities: Beijing, Shanghai and Guangzhou. The allowance will gradually rise to 49 percent by 2007 and the geographic restriction will be eliminated. However, to many people's surprise, "wolves" did not bite. There have been no applications for basic telecommunication services submitted by foreign investors thus far. There might be many explanations for foreign investors' reluctance. However, it clearly sends the signal to the Chinese government that the Chinese market is not as attractive as it might have perceived.

The primary purpose of this study is to find out what regulatory approach the Chinese government should take to further advance China's telecommunications service

industry in the coming decade. More importantly, the regulatory model proposed in this study aims to retain the sustainability of China's telecommunications industry. However, without understanding its history, any inquiry into the future is superficial. China's economy is officially branded as a "socialist market economy with Chinese characteristics". The name itself is intricate. In a sense, the concept of "socialist market" is plausible because it has been widely acknowledged that there has been no pure textbook market or socialist economy in history. However, "Chinese characteristics" makes the analysis of China's policy making extremely difficult, if not impossible. A great deal of this study is to understand what "Chinese characteristics" are and how they have shaped China's telecommunications.

## **1.2 Research Questions**

This study is initiated largely because there seems to be a lack of systematic analysis of China's telecommunications service industry and the regulatory regime in the relevant field. Scholars have approached similar subject matter from different perspectives. However, since this industry is developing so fast, previous research work is either no longer relevant or needs to be updated. In addition, although many efforts have been made to identify the factors that influence China's telecommunications industry, there is a lack of micro analysis of the interplay of the institutions within each factor. More importantly, scholars find it difficult to apply Western regulatory theories to China, particularly with the presence of Chinese characteristics. To some extent, previous research is fragmented and inconsistent.

The primary concern of this study is to look at different aspects of China's telecommunications regulatory regime and its impact on, as well as its interaction with, the regulated telecommunications service industry. It combines two levels of analysis. At the macro level, this study looks at how key economic, political and institutional conditions have shaped the regulatory regime and the industry. At the micro level, this study tries to identify different interest groups within each factor and reveal their interactions and influences. The levels of analysis seem to be separate. They are closely related however. Macro analysis builds the foundation for micro analysis. On the other hand, without a thorough micro analysis, macro analysis often loses credibility and becomes unpredictable.

This thesis aims to build a new regulatory model that is suitable to China's political, economic and social conditions. Existing regulatory theories will be tested; their applicability and limitations will be deduced. This study ends with a regulatory model that enables China's telecommunications industry to achieve sustainable growth within existing institutional constraints.

The researches questions are delineated as:

**RQ1:** What political, cultural and economic factors led to the current regulatory model for China's telecommunications service market, and how did this model enable China to modernize its telecommunications infrastructure and become the world's largest telecommunications market without relying on foreign capital?

**RQ2:** What are the problems/limitations of China's current regulatory model and is it sustainable? How could this model be adapted to make China's telecommunications industry sustainable within existing institutional constraints?

**RQ3:** How will China's choice of regulatory models shape its future telecommunications market and what impact will this have on foreign investment and China's economy?

### **1.3 Organization of the Dissertation**

This thesis consists of four parts. Part One reviews relevant literature on the subject matter and introduces the methodology. Part One has three chapters. Chapter one gives a brief introduction. With the focus on China, reviews of economic, political, social and cultural literature regarding telecommunications regulation will be conducted in Chapter Two. Chapter Three discusses methodology, scope and limitations of this study.

Part Two has one chapter. Chapter Four comprises an historical review of China's telecommunications. The primary concern of this part is why the government decided to give the telecommunications industry the first priority in the late 1970s and what strategies the Chinese government has adopted to leapfrog this industry. This part also discusses the rationales, goals and effectiveness of the Chinese government's plan of restructuring China's telecommunications service industry and regulatory regime.

Part Three consists of several case studies.

Chapter Five is a case study of the development of the Personal Handy Phone (PHS) system in China. The PHS is probably the most controversial service in China. Its debut and rapid development reflect vividly the dynamics among competing carriers, the regulator, consumers and other stockholders. The study aims to provide a grand picture of how China's system works and what the "Chinese characteristics" are. The case of PHS

also shows that the current regulatory regime is inefficient, if not antagonistic, in response to market demand and competition.

Chapter Six presents a case study of IPTV. IPTV is a typical example of new technology resulting from the convergence of telephone, television and the Internet. As regulators generally tend to fit new technology into the old regulatory model, there is clearly no easy way to handle the kind of new technology that spans several different domains. New technology can spur radical reform of the regulatory regime. However, it is also possible that new technology could be suppressed and die away due to uncooperative regulations. We have seen both cases in history. This chapter discusses whether China's current model is conducive to new technologies and what initiatives, if needed, should be taken.

Chapter Seven chooses 3G (the Third Generation Cellular Service) as this thesis's last case. The case of 3G is worth studying because it is the first time that China has the opportunity to compete with multinational telecommunication giants in terms of advanced standards. The decision on 3G will have a long term impact on China's future high-tech policy.

Part Four consists two chapters. Chapter Eight summarizes the preceding multi-case studies and draws a picture of the shape of the future to come. In this chapter, several alternative regulatory models and their applicability are discussed. Based on the analysis of their advantages and disadvantages, a new regulatory model with Chinese characteristics is proposed.

Chapter Nine concludes this thesis by discussing the impact of China's regulatory regime on both domestic and potential foreign competitors. A picture of the future of

China's telecommunications will be drawn. Also, the limitations of this study will be discussed.

## Chapter 2

### SURVEY OF LITERATURE

This chapter surveys the intellectual context of this study. The nature of telecommunications requires an interdisciplinary point of view. The relevant materials reviewed include, but are not limited to, management science, legal scholarship, social science and economics. The first section consists of a broad survey of regulation theories with a comparison between the United States and China. In the second section, the concept of “socialism with Chinese characteristics”, with its application to China’s telecommunications, will be reviewed. The third section goes into the details of various regulatory models.

#### 2.1 Regulation and Deregulation Theories

Theories of regulation come from two main sources: welfare economics and political theory (Horwitz, 1989). Welfare economics is about maximizing the level of social welfare by examining the economic activities of the individuals that comprise society. Political theory comes from various models trying to explain the genesis of regulation and the behavior of regulatory agencies<sup>3</sup>.

---

<sup>3</sup> For a fine discussion of various regulatory theories, see Horwitz (1989), *The Irony of Regulatory Reform: the Deregulation of American Telecommunications*.

### **2.1.1 In the Name of the “Public Interest”**

The literature on regulation is extensive, if not confusing (Horwitz, 1989). Nonetheless, the concept of “public interest”, that finds its root in welfare economics, is the key to understanding U.S. communications policy. In the past, the communications industry was under heavy government regulation. In the 1980s and 1990s, scholars began to call for a market approach to regulation. For example, Fowler and Brenner (1982) argue that broadcasters could best serve the public by responding to market forces rather than governmental directives. The perception of broadcasters as community trustees should be replaced by the view that broadcasters should be treated as marketplace participants. Instead of defining public demand and specifying categories of programming to meet this demand, the regulator should rely on the broadcasters’ ability to determine the wants of their audiences through the normal mechanisms of the market place. The public’s interest, then, defines the public interest (Fowler & Brenner, 1982).

One of the reasons supporting Fowler and Brenner’s argument is that spectrum is no longer scarce with the development of new technologies, such as data compression, cable systems, etc. They argue that scarcity is a relative concept. Technology makes it possible to overcome limitations once restricting regulators (Fowler & Brenner, 1982). However, as Browning points out, in some situations, even competitive markets are not capable of producing efficient outcomes. The presence of public goods and externalities are the two most important reasons why private markets fail. Externalities are defined as the harmful or beneficial side effects of market activities that are borne by people who are not directly involved in the market exchanges. Communication services, that

generally are non-rival and nonexclusive, fit the definition of public goods. The early chaos in radio communication before government regulation provides a vivid example of the harmful side-effect of externalities. According to Browning, when public goods and externalities exist, competitive markets cannot be counted on to generate efficient outcomes (Browning & Browning, 1989). Thus, some kind of government intervention is warranted.

If the public interest is equivalent to the consumer interest, consumers will vote directly by dollars instead of indirectly by their representatives in the Congress and the FCC. However, from the critical school's point of view, every vote is not equal because the market is often structured to serve those in power. Corporations usually have more power than consumers. In addition, consumers often do not have the interest or expertise to participate in the policy making process. Furthermore, capitalism encourages attainment of capital (money) at the expense of other social values. Consumers' indifference to political debates and the overwhelming power of big corporations will degrade their ability to make the right decisions. The consumer interest will inevitably surrender to the corporate interest. Individual liberalism will yield to corporation liberalism (McChesney, 1997). McChesney (1999) emphasizes that the mythology of the free market serves to protect the interests of the wealthy few. Even when the market is working at its best available condition, it can produce antidemocratic outcomes that must be addressed by a democratic polity.

From the perspective of critical legal studies, communications policy generally embodies a response to the dilemmas of a social and political system that frames problems in liberal terms. However, this conceptual structure is based on a hollow core

that renders its basic terms indeterminate. Critical legal studies argues that, even if all parties to the policy process were supremely intelligent, benevolent, honest, effective, and deadly serious about following the terms and procedures, the policy making process would still crumble of its own accord and fail to live up to its purported goals of impartially serving the public interest (Streeter, 1990). To critical legal scholars, most U.S communications policies rest on an unstable and contradictory collection of terms and concepts. Critical legal theory goes even deeper to question the rationale of the legal and policy system itself. Streeter argues that the slogan “the public’s interest, then, defines the public interest” as a marvelously blunt example of the closed loop of circular reasoning that characterizes the marketplace faith (Streeter, 1990). There are internal contradictions in the deregulatory philosophy. The idea of a market completely free from government is impossible.

Critical theorists tend to analyze the constantly changing phenomenon in a static way, which makes their theory sometimes look too radical and lack concrete support in reality. Another problem of critical theory is their ignorance of technological innovation, which is the defining characteristic of an information society. Thus, critical theory, which develops from and fits well to the relatively static industrial society, finds it somewhat difficult to fit to the information society. Horwitz provides a more comprehensive theory to understand both the genesis and the operationality of the regulatory agencies (Horwitz, 1989). Horwitz argues that history and analysis of actual decisions should be considered within the context of the structure of political power and fundamental economic conditions.

## **2.1.2 The Theory of Regulatory Contract and New Institutional Economics**

### **2.1.2.1 Regulatory Contract**

In “Deregulatory Takings and the Regulatory Contract”, Sidak and Spulber present the most comprehensive argument for stranded cost recovery in local telephone service and electricity supply. Sidak and Spulber argue that a regulatory contract exists between the regulatory agency and the privately owned utility providing service. They wrote:

Cost recovery is an essential element of contract law. ... Cost recovery is an essential aspect of utility regulation as well. Utilities would not have undertaken the extensive investments required to provide regulated service within their franchise region without the opportunity to recover their costs. (Sidak & Spulber, 1997, p.102)

Regulatory contract resolves the conflict between the obligation to serve at just and reasonable rates and the investors’ expectations of capital recovery and the right to earn a fair return on that capital. In the absence of just compensation, the deregulatory policies, such as removal of entry barriers, are assumed to create a ‘deregulatory taking’ or confiscation of private property. There are three components in the regulatory contract: entry controls, rate regulation, and utility service obligations. The regulatory contract might not have an explicit form. Rather, the regulatory contract is a “bundle of public utility statutes, utility commission precedents, adjudicatory decisions, rulemakings, hearings on the record, formal notices of proposed rulemaking, and the public

commentary” (Sidak & Spulber, 1997). The duration of the regulatory contract lasts until the firm has had a reasonable opportunity to recover its non-salvageable investments<sup>4</sup>.

Trebing (2000) argues that there is no well-established precedent for the regulatory contract. Although Sidak and Spulber take issue with the Court's decision, in the landmark Supreme Court case of *Munn vs. Illinois* (1877), the majority decision establishes the notion that, if a business affects the public interest, it is subject to economic regulation. As a result, such business is obligated to serve, but is given the opportunity to earn a fair rate of return (Trebing, 2000). Trebing (2000) finds that, although the utility is given an opportunity to earn a fair return, it is not guaranteed, which is particularly true in the face of major changes in demand and supply of technologies. In telecommunications particularly, it is the technological innovation, not the will of regulators, that drives deregulation, which Sidak and Spulber have overlooked. Baumol and Merrill (1997) also dismiss “regulatory contract” theory by arguing that, even if a regulatory contract did exist, no established constitutional doctrine requires recovery of historical cost. Drawing upon new institutional economics, although Williamson (1996) generally agrees that the economic organizations in general and regulations in particular are usefully addressed in contractual terms, he argues that the compensation should not be awarded one-hundred-percent recovery to stranded costs, as proposed by Sidak and Spulber. Rossi (1998) also points out that Sidak and Spulber ignore much of the post-World War II learning on public choice theory by assuming no self-interest seeking in economic regulations. Sidak and Spulber’s theory also ignores the

---

<sup>4</sup> Sidak and Spulber go on to discuss how to calculate stranded cost and propose Efficient Component-Pricing Rule. However, those are beyond the scope of this essay

historical context of utility regulations. The history of the U.S. telephone system shows that, it is not the regulation, but the competition, that played the vital role in the early expansion of the telephone network (Mueller, 1996). Government regulations, particularly in early telecommunications, are largely manipulated by the monopoly to protect its monopolistic interest rather than to provide universal service (Mueller, 1996).

### **2.1.2.2 New Institutional Economics**

Williamson (1996) points out that Sidak and Spulber's discussion of the "economic foundations" of regulatory contract theory has its origins in the new institutional economics literature.

Although new institutional economics falls within the domain of neoclassical theory, emphasizing human-made institutions, it goes beyond the routine economic focus on supply and demand analysis. Focusing on law, policies, bureaucracies, and other non-market structures, new institutional economics theory seeks to understand how organizations and governance play a role in either facilitating or prohibiting certain economic activities (Bates, 1995). In essence, institutionalism argues that "institutions matter" (Koelble, 1995).

Institutions, as defined by North, are the "rules of the game" in a society. They are the rules that a society establishes for human interaction and for reducing the uncertainty involved in human interaction by giving people patterns for their behavior (North, 1991). Institutions may be created formally, as was the United States Constitution; or they may simply evolve over time, as does the common law. North makes a distinction between

formal institutions (e.g. constitutions, laws, regulations, property rights, etc.) and informal institutions (e.g. sanctions, conventions, codes of conduct, etc.). Formal and informal institutions collectively influence organizational governance. He also points out that institutions change in an incremental manner rather than in an abrupt fashion (North, 1990). North also emphasizes the importance of enforcement mechanisms. Institutions often are ineffective if they are not enforced. He wrote,

“although the rules are the same, the enforcement mechanisms, the way enforcement occurs, the norm of behavior, and the subjective models of the actors are not. Hence, both the real incentive structures and the perceived consequences of policies will differ as well.” (North, 1990, p. 101)

In light of new institutionalism theory, regulations, laws, and policies can be regarded as a set of formal institutions influencing telecommunications sector reform and trade. In a cross-country study of the telecommunications industry, Levy and Spiller (1996) find that the institutional endowment of each country constrains regulatory governance and incentives, and, consequently, plays a role as an important determinant of effective sector policy reform and industry performance. The institutional endowment, especially for the formal institutions, is believed to play a critical role in shaping national telecommunications regulatory policy. This sheds light on the fact that performance and regulatory outcomes vary across countries even though pressures and tendencies are similar. They conclude that the goodness of fit of the regulatory system with a country's institutions is the key to the success of private utilities.

### **2.1.2.3 Application of the Regulatory Contract Theory to China**

There are several fundamental difficulties in applying Sidak and Spulber's regulatory contract theory to the study of China's telecommunications.

First, state ownership dominates China's telecommunications industry. All the major Chinese telecommunications carriers are state-owned enterprises (SOEs). Private and foreign capital is only allowed in value-added services that are not subject to traditional utility regulations such as universal service obligations, rate control, etc. Theoretically speaking, SOEs should have social responsibilities innately because of their public ownership. In the perfect socialist economy, the goal of the firm is not to make profit for its investor, but to "serve the people". Thus, there is no conflict between the state and the public firm. Consequently, there is no need for explicit or implicit regulatory contracts whatsoever. Certainly, there is no such Utopian society in the world. However, if the theoretical foundation of regulatory contract is to secure private investment from unconstitutional deregulatory taking, it certainly does not lend itself to the regulation of SOEs.

Second, some of the economic foundations Sidak and Spulber use to support the regulatory contract theory are obsolete. Asset specificity is the key element of the economic foundation of the regulatory contract theory. Since "regulatory assets, including expenditures for plant and equipment and capitalized outlays to perform duties mandated by regulators, are likely to be transaction-specific. That is, the assets have little value outside the regulatory transaction", the problem of regulatory opportunism presents itself (Sidak & Spulber, 1997). The regulator might intend to take advantage of the huge

unsalvageable private investment. Thus, a regulatory contract is needed to ensure that the utility has the opportunity to recover all of its costs associated with the transaction. However, technological innovations affect the degree of asset specificity. This is particularly true in telecommunications. The evolution of telecommunications technologies is gradual, rather than abrupt. New services are usually built upon old facilities. Copper wires, which could only provide narrow-band plain telephony services 10 years ago, are now able to carry broadband traffic using DSL technology. The same pattern can be found in wireless communications as well. Even if some facilities can not be reused, as mentioned before, losses incurred by technological innovations should not be compensated by regulators.

Although there are some theoretical flaws in applying the whole set of Sidak and Spulber's regulatory contract theory to the study of China's telecommunications, at the conceptual level, some of their arguments, particularly those with connections to the new institutional economics, are relevant to the designing of China's telecommunications regulatory regime with an eye to the potential involvement of private capital in the future.

### **2.1.3 Deregulation for "Development"**

It is believed that a modern and adequate telecommunications infrastructure can benefit a country's development. With an improved telecommunications infrastructure, production activities can be efficiently organized and market information can be promptly delivered, thus generating more benefits (Parker, 1984). Although the finding is not conclusive, many studies have found that the relationship is positive. For example,

evidence from 21 OECD countries over a 20-year period demonstrates evidence of a significant positive causal link, especially when a critical mass of telecommunications infrastructure is present (Roller, 2001). In the United States, a two-way causal relationship between telecommunications infrastructure investment and economic development has been tested at the state and sub-state level. The result is consistent with the national-level analysis that the level of economic activity at any point in time is a reliable predictor of the amount of telecommunications investment at a later point in time and vice versa (Cronin, 1993). In developing countries, the empirical data confirms that there exists a positive and statistically significant causal relationship, running from telecommunications to income, between telecommunications infrastructure and income in Poland (Cieslik & Kaniewska, 2004). By applying modern time series techniques, Yoo shows that bi-directional causality runs from IT investment to economic development for Korea which means that increased IT investment directly affects economic development and that an increase in real income also influences IT investment (Yoo, 2004). At the regional level, Hackler studies the linkage between telecommunications infrastructure and high-tech industry growth in cities of two metropolitan areas, Minneapolis-St. Paul, Minnesota and Phoenix, Arizona. He finds that that the cities with greater telecommunications capacity are more likely to have positive growth in high-tech industry and other sectors (Hackler, 2003).

Studies of telecommunications and its contribution to economic growth are well received in China. At the beginning of 1980, the government began to list posts and telecommunications as a preferential construction program. In 1984, when vice-premier Li Peng took control of the Leading Group for the Revitalization of the Electronics

Industry, telecommunication was put at an even higher place on the government's agenda (Harwit, 1998). In so doing, arguably, China has also largely abandoned its nationalist technology strategy in favor of a more pragmatic strategy of importing advanced technologies and directing domestic R&D toward commercial purposes (Kraemer, 1995).

Chen (1993) identifies four driving forces behind China's explosive telecommunications growth. First, economic reform increases the exchange of information in all aspects of China's economy and, thus, creates a huge demand for modern telecommunications; second, decentralization of authorities gives provincial and local governments, business organizations, and individuals incentives to invest in telecommunications; third, new technologies makes it possible for China to leapfrog to a modern telecommunications system; fourth, new employee incentive systems in which employees are evaluated based on their performance are established (Yunqian Chen, 1993). In addition to those forces outlined above, in the mid-1980s the Chinese leadership made moves to dilute the strength of powerful industrial ministries. As a result, the MPT (Ministry of Posts and Telecommunications), as the telecommunications monopoly, became a target for the more liberal market reformers (Harwit, 1998). Other ministries were encouraged to compete with the MPT. Internationally, pressure from the World Bank was also pushing the Chinese government to break the state monopoly and liberate the market (Harwit, 1998).

#### **2.1.4 The Objectives of China's Telecommunications Regulation and Deregulation**

Few have looked at the objectives of such a reform. In the Chinese saying, a plan without a clear target is similar to a tree without a root. The recognition of the leading role of telecommunications in the national economy by the government resulted in the early take-off of China's telecommunications in the 1980s. The restructuring of the carriers in the late 1990s and early 2000s is regarded as the government's further effort to introduce competition, improve efficiency and strengthen domestic carriers' position in the face of international competition. However, the development and regulatory measures are often confused with the policy objectives. In this section, the primary objectives of China's telecommunications reform are discussed.

There appears to be a consensus that the "public interest" is the key to understanding the U.S. communications policy. In question is whether or not consumer interest defines the public interest. In China, some scholars argue that the primary objective of telecommunications reform is to maximize consumer interest (Kan, 2003; Wang & Liu, 2002; Yuan, 1999). Kan Kaili argues that the Chinese government has taken the wrong direction by putting the emphasis of reform on strengthening the state-owned enterprises instead of consumer welfare (Kan, 2003). On the contrary, other scholars argue that consumer interest can not represent the public interest. Citing the low telephone penetration, Zhang Xinzhu, a research fellow of the China Social Science Academy, argues that, since the consumers of telecommunications services only consist of a small portion of the total population, consumer interest is not equal to the public interest (X. Zhang, 2001). He concludes that the primary objective of China's

telecommunications reform is to expand the benefit of telecommunications to as many people as possible<sup>5</sup> (X. Zhang, 2001).

Strengthening domestic enterprises is another important objective. Shi Wei, a fellow from the Institute of the Economic System and Management of the State Council Office for Restructuring the Economic System, argues that there should be a leading enterprise in China's telecommunications industry. He adds that the government-controlled monopoly should be turned into the market-created monopoly in order to compete with giant multinational companies (Shi, 2002). Hu Hanhui, an economics professor of Southeast University and one of the translators of the popular book "Telecommunications Competition", also emphasizes that one symbol of the success of China's telecommunications reform is the strengthening of domestic carriers. He expects the Chinese carriers not only to compete successfully in the domestic market, but also to expand to foreign markets (h. Hu, 2001). More specifically, Xu Lin, an associate professor of Zhejiang University, argues that China should establish an oligopoly market structure in basic telecommunications sectors (l. Xu, 2002).

In summary, development is the key objective of China's telecommunications policy. Expanding advanced telecommunications services to more and more people is another important goal. Moreover, telecommunications is expected to be the driving-force of the national economy. It is also expected that domestic companies reinforce their positions in face of international competition. As expressed in a famous Chinese slogan,

---

<sup>5</sup> Zhang's article is published in a journal which is sponsored by the State Council Development Research Center. Thus, it should be considered, to some extent, to reflect the Chinese government's attitude toward the telecommunications reform.

the basic attitude of the Chinese government towards telecommunications is “compete internally (domestically) and unite externally (in the international competition)”.

## **2.2 Chinese Characteristics**

The market is an organized process by which buyers and sellers exchange goods and services for money. We rely on markets to cope with the fundamental problem of scarcity. What we produce, how we produce it and how we distribute it are the three fundamental questions every society needs to answer. There are three basic institutional devices to answer these questions: traditional-based, command-based, and market-based. In the market-based economy, every participant pursues self-interest in the market place. The function of the market is to coordinate and control this decentralized decision-making process. In a transition to a market-based economy, China is positioned somewhere between those three kinds of economies. China’s goal, officially, is to build a unique socialist market economy. In this section, the meaning of socialism with Chinese characteristics and its reflection on China’s telecommunications will be reviewed.

## 2.2.1 Socialism with Chinese Characteristics

### 2.2.1.1 Deng Xiaopin's Theory

In the opening speech at the twelfth national congress of the Communist Party of China, Deng Xiaoping delivered his famous theory of “socialism with Chinese characteristics”. He said:

We must integrate the universal truth of Marxism with the concrete realities of China, blaze a path of our own and build a socialism with Chinese characteristics -- that is the basic conclusion we have reached after reviewing our long history.<sup>6</sup>

Deng's theory is regarded as the new stage of Marxist philosophy in contemporary China. The core of Deng's theory is "seeking truth from facts". Deng emphasized that “seeking truth from facts” was not his invention, but the quintessence of Marxism-Leninism and Mao Zedong Thought.

Socialism with Chinese characteristics is based on the following assumptions (Ouyang, 2001):

1. Socialism is the primary stage of communism. Communism “calls for highly developed productive forces and an overwhelming abundance of material wealth. Therefore, the fundamental task for the socialist stage is to develop the productive forces”<sup>7</sup>. Thus, the basic doctrine of socialism is to eliminate poverty and enrich all members of society, although the pace of different groups might vary;

---

<sup>6</sup> Excerpt from the opening speech at the twelfth national congress of the Communist Party of China, available at <http://english.peopledaily.com.cn/dengxp/vol3/text/c1010.html>, accessed on 11/1/2005.

<sup>7</sup> Excerpt from a talk with the Japanese delegation to the second session of the Council of Sino-Japanese Non-Governmental Persons, available at <http://english.peopledaily.com.cn/dengxp/vol3/text/c1220.html>, accessed on 11/1/2005.

2. The development models of socialism in the world are not universal. In different countries, socialism requires different models and different ways. Every country should take its unique characteristics into consideration;

3. The market mechanism is neutral. “The proportion of planning to market forces is not the essential difference between socialism and capitalism. A planned economy is not equivalent to socialism, because there is planning under capitalism too; a market economy is not capitalism, because there are markets under socialism too. Planning and market forces are both means of controlling economic activity”.<sup>8</sup>

Deng articulated three fundamental criteria for judging a policy: whether it is favorable for promoting growth of the productive forces in a socialist society, whether it is favorable for increasing the overall strength of the socialist state, and whether it is favorable for raising the people's living standards. The criteria were called "three favorables." (Ouyang, 2001)

Deng also repetitiously stressed that socialism with Chinese characteristics must not deviate from the Four Cardinal Principles, which are the basic prerequisite for achieving modernization, ideologically and politically. The Four Cardinal Principles are:

- We must keep to the socialist road;
- We must uphold the dictatorship of the proletariat;
- We must uphold the leadership of the Communist Party;
- We must uphold Marxism-Leninism and Mao Zedong Thought.

---

<sup>8</sup> Excerpts from talks given in Wuchang, Shenzhen, Zhuhai and Shanghai, available at <http://english.peopledaily.com.cn/dengxp/vol3/text/d1200.html>, accessed on 11/1/2005.

Deng believed that sticking to the Four Cardinal Principles would ensure China's long-term stability which was a crucial prerequisite for China's modernization. He said to George H.W. Bush, who was then the U.S. President:

“In China the overriding need is for stability. Without a stable environment, we can accomplish nothing and may even lose what we have gained. China must adhere to the policies of reform and opening to the outside world: there lies our hope of solving our problems. But it is impossible to carry out reform without a stable political environment... Democracy is our goal, but we must keep the country stable.”<sup>9</sup>

Essentially, Deng's theory is two-sided. On the one side, it asserts that China has already established a socialist society that must be preserved. First, China has established a socialist economic system, in which public ownership is dominant. Second, China has a socialist ideological system, in which Marxism takes the guiding role. Third, China also has a socialist political system. The leadership of the Communist Party is unshakable. On the other side, China's socialism is still in its “initial” stage<sup>10</sup> because of China's poverty and economic backwardness, which, supposedly, constrain the further development of China's socialism. Therefore, in the initial stage, the central task is to emancipate productivity (Mackerras, Taneja, & Young, 1998). Hence, all the Party programs should focus on economic growth. His “three favorables” criterion accurately reflects this line of thinking. Anything that benefits economic growth can be considered consistent with socialism with Chinese characteristics as long as it does not threaten the legitimacy of the Party's leadership. In a sense, “socialism with Chinese characteristics” means little more

---

<sup>9</sup> Excerpt from a talk with President George Bush of the United States, available at <http://english.peopledaily.com.cn/dengxp/vol3/text/c1940.html>, accessed on 11/1/2005

<sup>10</sup> Deng predicted that the initial stage would last at least 100 years until most Chinese people could live a comfortable life which is comparable to western developed countries.

than a justification for the Party's shift of focus from class struggle to economic growth (Mackerras, Taneja, & Young, 1998).

### **2.2.1.2 Jiang Zheming's Three Representatives**

Attempting to broaden Deng's theory and secure the Party's shaky leadership role, former President Jiang Zheming proposed the so-called "Three Represents Thought" (Jia, 2004). According to Jiang, the Party must always represent the requirements of the development of China's advanced productive forces, the orientation of the development of China's advanced culture, and the fundamental interests of the overwhelming majority of the people in China. There is nothing new in Jiang's thought except the third one. It is widely believed, at least literally, the "overwhelming majority of the people" include not only proletariat (peasants and workers), but also bourgeois and entrepreneurs, if not capitalists. Jiang's theory has encountered quiet, but heated, opposition within the party. Many people find the theory incomprehensible. Some people believe that Jiang's promotion of "three represents" is an attempt to fortify his own position as a Marxist theorist on the level of Mao and Deng.

### **2.2.1.3 Harmonious Society and Healthy GDP**

Hu Jintao and Wen Jiabao, successors of Jiang, have shown their intention to steer China from favoring economic growth at all costs, represented by high GDP growth rate, to a more balanced type. Hu and Wen urge the Party to make great contributions to build

a harmonious society. The new leadership of China has embraced a new slogan, stressing "sustainable development," "innovation", "a resource-saving, environment-friendly society" and "green GDP" (Melinda, 2006). It is interesting that, in the three years since Hu assumed the leadership of the Party, his image has changed markedly from a potential liberal reformer to a conservative authoritarian. However, there is no evidence that Hu will retreat from the core belief that economic growth is essential to social stability and the Party's survival ("Asia: Hu's in charge; China", 2005).

Nevertheless, in the next several decades, Deng's theory of socialism with Chinese characteristics will continue to be the guiding ideology for China's development. Patchworks might continuously be added, but the theme shall not change.

Deng's socialism with Chinese characteristics sets the stage for a complex drama. Anything that is not consistent with classical theories of socialism and capitalism can be readily branded as a Chinese characteristic. Deng encouraged the Chinese people to neglect "abstract" theoretic debates and try anything that might be helpful to advance China's modernization. His famous saying "no matter it is a white cat or black cat, as long as it catches mouse, it is a good cat" illustrates his pragmatic and flexible approach in dealing with economic affairs.

### **2.2.2 Telecommunications with Chinese Characteristics**

Deng' theory sheds light on the study of China's telecommunications with Chinese characteristics. Mueller and Tan (1997) find, on the one hand, since the Party began to recognize the importance of communications infrastructure to the national economy, it

has been using various policies and regulations to boost the telecommunications sector, including decentralization of ownership, industrial restructuring, government restructuring, etc.; on the other hand, the Party is very cautious of its sovereignty and the stability, order, unity and macro-economic control (Mueller & Tan, 1997). Ure (1994) also recognizes that the desire of domestic interests who want to break into the profitable telecommunications business and the desire of the Communist Party to maintain control of the nation in an environment of rapid economic growth and decentralizing reforms are the two distinct features of telecommunications with Chinese characteristics. Dai (2002) argues that, while the Chinese government is determined to promote information technologies in order to catch up with developing countries, the current Chinese leadership does not want to simply copy development models formulated by the West.

## **2.3 Regulatory Models**

### **2.3.1 The “Silo” Model**

The first set of formal telecommunications regulation on telephone appeared to be the 1934 Communications Act, under which common carriers were required to provide service to all customers on a nondiscriminatory basis and set just and reasonable prices. Telecommunications was regarded as natural monopoly<sup>11</sup>. Supposedly, the 1934 Act purported to control the power of monopoly and protect consumers. However, the then

---

<sup>11</sup> In economics, a natural monopoly occurs when, due to the economies of scale of a particular industry, the maximum efficiency of production and distribution is realized through a single supplier.

AT&T did not oppose the principles of the 1934 Act because they actually endorsed AT&T's monopoly position (Mueller, 1996). Most other countries followed suit<sup>12</sup>. This model is conventionally called the PTT (Posts, Telegraph and Telephone) Model.

In the 1990s, recognizing that competition had existed in many markets, the U.S. Congress passed the Telecommunications Act of 1996 which lifted legal barriers to the entry of new players in telecommunications markets. But, as argued by many scholars, the 1996 Act itself is only an amendment to the 1934 Act. The economic principle of the 1996 Act still focuses on the control of monopoly power in local telephone service that is considered as the bottleneck of telecommunications. More importantly, in both the 1934 and 1996 laws, specific regulatory treatment is based on the techno-functional characteristics of the services those carriers are providing. This model is widely referred as the "Silo Model".

Generally speaking, China also takes a "silo approach" in telecommunications regulation. Since 1949, television networks and telecommunication networks have been regulated by different government agencies. With the advancement of new digital technologies, both TV networks and telecommunication networks are able to provide high-speed broadband services. However, both networks and their regulators are trying to maintain monopoly power over their traditional service domains and, at the same time, trying to penetrate into each other's area. In 1999, State Council Decree 75 reiterated the national ban on network convergence. Since then, no license has been issued to television/cable/radio companies to offer telecommunication services by the MII, and the

---

<sup>12</sup> While the U.S. telephone system was run by private monopoly, most other countries' telecommunications systems were state-owned.

SARFT has also strictly prohibited telecommunication carriers from entering the television market.

### **2.3.2 The Layered Model**

Over the last few years, a growing number of scholars, industry observers, and the European Union have endorsed a the layered approach to telecommunications regulation. The layered model of regulation is thought to be a radical alternative to the Silo approach.

#### **2.3.2.1 The Problems of the Silo model**

Werbach (2002) summarizes four fundamental problems with the current vertical (he calls horizontal) approach: it assumes distinctions between individual services are clear (in a converged network, traffic can actually ride on any type of network); it applies most rules in an all-or-nothing fashion (many IP-enabled services bear indicia of more than one regulatory category, such as IPTV provided by telephone carriers); it looks at each service category in isolation (interconnections become essential and indispensable); it concentrates on the services ultimately provided to end-users (behind-the-scenes network architecture becomes the driving force of competition). Sicker (2002) also points out that, when providers of similar services are regulated differently, it encourages some of them to take advantage of certain regulatory policies. Specifically, Sicker (2002) outlines nine problems of the “silo” model: interconnection distortions, universal service concerns, bundling discrimination, content discrimination, accessibility concerns,

security concerns, safety concerns, market distortion and investment and deployment distortion.

### **2.3.2.2 Theoretical Foundation for the “Layered model”**

Solum and Chung (2004) argue that the layered model synthesizes software engineering and Benkler’s<sup>13</sup> work on the regulation of communications, in which Benkler extends, generalizes, and abstracts the notion of layers.

The first insight can be called the code thesis: the notion that the architecture of the Internet has profound implications for its legal regulation. The second insight can be called the end-to-end principle, an idea from network engineering that Lessig applies to Internet regulatory policy. Lessig argues that the end-to-end principle captures the key feature of the Internet architecture that enables the Internet to become an engine of innovation. (Solum & Chung, 2004, p.820)

Lessig is another pioneer in layered research. Lemley and Lessig stress that the assumptions the policy makers should make about regulation of the Internet should reflect the design principles of the Internet itself, among which the “end-to-end” principle<sup>14</sup> is particularly relevant. Their opinions accord with the layered model, that allows competition at the higher-level layers (especially applications and content, but also potentially at lower layers) despite the existence of bottleneck at the physical layer (Lemley & Lessig, 2001). While it is profoundly insightful, the “end-to-end” principle seems to be too simplistic to provide practical policy and regulatory guidelines. Hoping

---

<sup>13</sup> See Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Common and User Access*, 52 Fed. Comm. L.J. 561, 562-63 (2000). Benkler identifies three fundamental layers, which he calls "the physical infrastructure, logical infrastructure, and content layers."

<sup>14</sup> Lessig describes “end-to-end” principle as putting the "intelligence" at the top of a layered system, while keeping communications protocols as simple and as general as possible.

to yield a richer and more accurate model of the fundamental architecture of the Internet, Solum and Chung extend the “end-to-end” principle to the layers principle (Solum & Chung, 2004). They argue that regulations should respect the integrity of the layers and aim to avoid interference with the layered nature of Internet architecture (Solum & Chung, 2004).

### **2.3.2.3 Benefit of the Layered Model**

Werbach (2002) makes four points about the benefits of the layered approach. He argues that the layered approach: removes the assumption that service boundaries are clear and are tied to physical network boundaries; implies a more granular analysis within each layer; brings to the forefront the issues of interconnection between networks, and between functional layers within those networks; recognizes the significance of network architecture as a determining factor in shaping business dynamics. Sicker (2002) also believes that the real value of the layered model is that “regulation can be minimized or compartmentalized by considering the role of regulation on each layer distinct from the layer above or below it” (p.9).

### **2.3.2.4 Design of the Layered Model**

In a larger communication systems context, Benkler (2000) suggests a tripartite model comprising a "content layer", a "logical layer", and a "physical layer". At the bottom is the physical infrastructure layer including wires, cable and radio frequency

spectrum. Software comprises the logical infrastructure. On the top is the content layer (Benkler, 2000). Werbach (2002) recommends a four-layered model: physical, logical, applications (services) and content. Adding some sub-layers, McTaggart (2003) also proposes a four-layered model similar to Werbach's. Sicker (2002) argues that earlier proposed models tend not to consider the issues of interconnection, market power or the transition to such a layered model. Sicker rejects the notions of "logical layer" and "code layer" and returns to a simplified TCP/IP model including physical services, application services and content.

Recognizing that most of the layered models proposed suffer from the limitation of treating all layers equally, Werbach (2005) refines his original model to a double-necked hourglass one (see Figure 2-1). Werbach's refined model echoes Sicker's concern for interconnection issues. The thrust of Werbach's model is that it specifically distinguishes between two kinds of layers: functional (primary services delivered to end-users) and connective (interconnection between the layers). Werbach (2005) argues the primary concern of policy makers should shift to connective layers, which are the most crucial parts in the communications system but have been largely ignored.

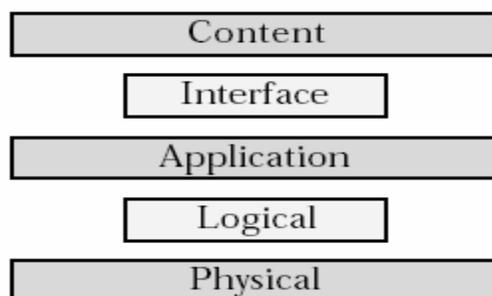


Figure 2-1: Double-necked hourglass layered model proposed by Werbach<sup>15</sup>

---

While details vary, there are commonalities among those proposed models. First, the applications layer should be separated from the lower layers. To this end, open interface is crucial to ensure continuous innovation. Second, the content layer should be separated from the application layer. The nature of content is different from that of conduit, which warrants different regulatory treatment. The specification of the TCP/IP protocol suite inspires the layered-approach modeling. However, as Sicker (2002) points out, the layered model should deal with business and policy characteristics, avoiding being tightly wedded with any particular technical protocol.

### 2.3.2.5 Current Implementation of the Layered Model

Early theorists tend to be strict with the engineering nature of the layered model. Lemly and Lessig (2001) emphasize that the layered model will be effective only if the

---

<sup>15</sup> Note. From Werbach, K. (2005). Breaking the Ice: Rethinking Telecommunications Law for the Digital Age. *Journal on Telecommunications & High Technology Law*, 4, 59-95.

layers are not vertically integrated. Solum and Chung (2004) highlight two principles of the Internet regulation: layer separation and minimizing layer crossing. Thus, a layered regulatory approach would possibly free some ventures from heavy-handed regulation and impose new regulatory burdens on ventures historically exempt from regulation. Frieden notes that such a model will not work in the United States if it increases government oversight (Frieden, 2003). Since key industry stakeholders appear to benefit more from the current silo model, which enables them to exploit asymmetry in regulatory treatment and qualify for less rigorous government regulation, and, having not fully recognized variability in regulating integrated ICE (information, communication and entertainment) companies, the FCC and courts are more comfortable with making all-or-nothing decisions, Frieden points out that the layered model has not generated much interest among decision makers (Frieden, 2004).

While the FCC has never officially adopted the layered model, Cannon (2003) argues that the Computer Inquiries followed the layered model of regulation and sought to constrain anticompetitive behavior where it occurred. Sicker and Mindel (2002) also explain the layered approach as an extension of the Computer Inquiry. Cannon (2005) also finds some state authorities have taken the layered approach, or a mixed one, in regulating VoIP services. Former MCI became a particular supporter of the layered model. Recently, MCI issued a whitepaper entitled “Codifying the Network Layers Model”<sup>16</sup>, which begins to translate the conceptual model into concrete policy proposals.

---

<sup>16</sup> See Richard Whitt, Codifying The Network Layers Model: MCI’s Proposal for New Federal Legislation Reforming U.S. Communications Law, March 2004, at <http://global.mci.com/about/publicpolicy/presentations/layersmodelfederallegislation.pdf>

The European Union has already begun to move into a new regulatory direction.

The idea of the EU model is simple and straightforward, as explained by Marcus:

European Commission will begin by defining a series of relevant telecommunications markets, and by providing a set of guidelines for determining the presence or absence of market power, all based on methodologies borrowed from competition law and economics. Within each market, the National Regulatory Authority (NRA) in each member state will determine whether one or more parties possess SMP (Significant Market Power). If SMP exists, the NRA will impose appropriate obligations from the set noted in the previous paragraph, taking into account the specifics of the particular marketplace in question. These obligations are imposed *ex ante*, based on the presence of SMP - it is not necessary to demonstrate that market power has been abused. Conversely, if the NRA fails to find SMP, then any such obligations that may already be in place must be rolled back. (Marcus, 2003, p.123)

Frieden (2003) indicates that the European Commission attempts to use a harmonized regulatory approach to make an assessment of what a company currently provides and whether it possesses market power without consideration of its legacy status. Whitt also regards the European Commission's new regulatory framework as case of explicit endorsement of the layered thinking about regulatory policy (Whitt, 2004).

#### **2.3.2.6 Critics of the Layered Model**

The layered model has its share of critics. One alleged advantage of the layered model is technological neutrality. However, the layered model is largely inspired by the architecture of the computer network, the Internet in particular. The implicit assumption of the layered model is that the TCP/IP architecture of the Internet is superior to others. Werbach insists that communications policy will eventually be a subset of Internet policy

---

(Werbach, 2002). True technological neutrality favors agnostic regulatory philosophy. Policy makers should not be tempted by existing network architecture, rather, they should encourage the development of entirely new network architectures, platforms, and providers (Thierer, 2005). The layered model also suffers from its ambiguity. Sicker and Mindel (2002) acknowledge that many of the details of the model and the concepts used to describe the model need to be clearly defined; otherwise failures might arise in the emerging competitive communications markets.

The New Millennium Research Council issued a report entitled “Free Ride: Deficiencies of the MCI ‘Layers’ Policy Model and the Need For Principles that Encourage Competition in the New IP World” in which contributing authors raise questions about the practicality of the layered model and the costs of new regulation. While those commentators generally agree that the current regulatory regime is insufficient and, at the theoretical level, the concept of layering is an important analytical tool, they identify four deficiencies: the model simplifies complex network interconnections; the model transfers the current regulatory model for traditional telecom networks to future broadband networks; the model discourages technological innovation and network investment; the model ignores the benefits that vertical integration can provide for the industry and consumers (New Millennium Research Council, 2004).

### **2.3.3 Anti-Trust and Competition Law Model**

Theoretically, an antitrust model for telecommunications regulation would eliminate sector-specific regulation, leaving only the background rules of antitrust to

police instances of market abuse. New Zealand once was the first, if not the only, country to adopt such a model.

In the late 1980s, New Zealand decided to liberalize its telecommunications industry and privatize its old PTT. Unlike most other countries that generally take gradualist approaches, New Zealand decided not to create a regulatory agency to oversee telecommunications markets and to rely solely on competition policy to protect consumers. New Zealand policy makers argue that regulatory authorities are often inefficient and expensive. In addition, the small economy of New Zealand can not take the risk of over-stimulating investment by new entrants as a potential consequence of pro-competitive policies. The New Zealand government believes that their competition law itself is robust enough to pose the threat of competitive entry to the dominant carrier (Lojkine, 1992). Indeed, New Zealand's model is described by Dordick as "testing the limits of deregulation" (Dordick, 1989, p.29).

New Zealand seemed to make significant progress initially. The antitrust model appeared to be particularly effective in attracting new entrants (Hoewing, 1999). As Saunders (1994) wrote, "competition regulates activity, interconnection is working and government policy for competition is a success" (p.46).

However, New Zealand's experiment does have problems. Particularly, the removal of *ex ante* regulations does not remove the issues of access to limited resources and interconnection. Dissatisfaction of the public and the government with the lengthy litigation on access and interconnection issues impel the recent reversion (Haucap & Marcus, 2005). The passage of the 2001 New Zealand Telecommunications Act, in which the Commerce Commission is mandated to regulate *ex ante* certain services, indicates

that New Zealand has, to some extent, come back to a traditional, although comparatively light-handed, regulatory system.

Some U.S. scholars also advocate for a similar anti-trust model. May suggests that a market-oriented model that employs antitrust law or antitrust-like principles, which focus on the structure of the marketplace, should form the basis of a new regulatory regime (May, 2006). The Progress & Freedom Foundation proposes a model largely drawn on anti-trust principles, emphasizing that protection of consumer welfare is the paramount goal of communications policy (The Progress & Freedom Foundation, 2005). U.S. scholars seem to have learned its lesson from New Zealand. Proposed models all allow the regulatory agency to take *ex ante* actions to prevent violations of the antitrust laws. The Progress & Freedom Foundation's proposal further suggests mandated interconnection without a finding of an abuse (The Progress & Freedom Foundation, 2005).

## Chapter 3

### METHODOLOGY

#### 3.1 The Overall Approach and Rationale

##### 3.1.1 Interpretive Paradigm

Potter, Cooper and Dupagne (1993) argue that there are three coexisting paradigms in mass communications research: social scientific, critical/ideological and interpretive legal/policy/historical. Legal/policy studies share some characteristics of both social scientific and critical/ideological paradigms without being a clear example of either of them. Legal/policy studies appear like social science studies in their attempt to explain some phenomena of the media without relying on an explicit ideological framework. They also appear like critical/ideological studies in their lack of interest to generalize theories beyond the set of examples or cases cited (Potter, Cooper, & Dupagne, 1993). In terms of “interpretive”, unlike the critical/ideological paradigm, legal/policy studies do not necessarily focus on how individuals make meaning out of the media. Instead, they refer to the perspective that certain researchers have when they provide contexts in order to construct a pattern of interpretation for individual events. Therefore, the legal/policy interpretive paradigm emphasizes discourse.

Communication law and policy studies deal with a wide range of topics, including traditional First Amendment theory, privacy, freedom of information, and copyright. It

also includes telecommunications policy issues, such as media convergence, e-commerce, digital divide, universal service, Internet law, and information economics. The study of communications law and policy requires an interdisciplinary perspective. Researchers should have a broad understanding in technology, business, philosophy, and law in addition to their respective specialized areas. The interdisciplinary feature also implies that there is no omnipotent research method in this field. Researchers usually approach the same issue from different perspectives. The openness of this field enables researchers to make informed policy suggestions.

### **3.1.2 Exploratory Approach**

This study is exploratory in nature. First, although China's telecommunications industry has been reported intensively on both domestic and international media, the policy making itself, as well as its rationales, has never been studied comprehensively; second, the research topic involves a high level of uncertainty with a view of the fast changing landscape of the Chinese telecommunications industry. However, this study avoids a purely descriptive approach. The multi-case study starts with a preliminary theory related to China's regulatory model. Existing theories will be tested by within-case and cross-case analysis; their applicability and limitations will be deduced. This study ends by proposing a new regulatory model that is suitable to China's political, economic and social conditions.

## **3.2 Research Design**

### **3.2.1 Case study**

This study employs a combination of qualitative and quantitative methods within the framework of a multi-case study.

The method of the study to address the research questions raised will be mainly qualitative analysis of data and documents. This study will be built upon a multi-case study. Due to the interdisciplinary nature of telecommunications, concepts will be borrowed from economics, political science, engineering and management.

The term "case study" has several different meanings. It can be used to describe a unit of analysis. In this sense, a case study can be undertaken at various levels, such as the individual, organizational, or country level. It can also be defined as a kind of research method. Yin (2003) defines "case study" as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p.13). Clearly, a case study is the intensive investigation of a specific individual or context. Typically, a case study examines the interplay of all variables within the site of interest in order to provide as complete an understanding as possible. In the communications field, the case study is usually situated in the third paradigm called "thick description" that features an in-depth description of the research subject and the nature of the context in which the subject is located. Although case study is usually treated as a qualitative method, it features an interdisciplinary approach. Depending on the philosophical assumptions of

the researcher and the nature of the research question, the study of a specific case can be positivist, interpretive, critical, or combination of all. In other words, there is no single method to conduct a case study. The case study is preferred when the researcher has little control over the events, and when there is a contemporary focus within a real life context. The case study method requires a holistic understanding of the site in question. There are various goals of adopting the case study method, to provide description, to test theory, or to generate theory (Eisenhardt, 1989).

Regarding the theory building function of the case study method, there was a famous debate between Eisenhardt and Dyer in the late 1980s. Eisenhardt, who was a management professor at Stanford University, argued that using multiple cases, rather than a single case, was a powerful means to create theory because it permitted replication and extension among individual cases. She also argued against the stereotype of case study as free-form. She called for more methodological rigor in elaborating theory from case study (Eisenhardt, 1989). On the contrary, Dyer and Wilkins argued that Eisenhardt's position was a response to decades of strong and repeated calls for more qualitative, contextual, and interesting research (Dyer & Wilkins, 1991). They argued that Eisenhardt's position was more or less similar to the hypothesis-testing research model which would inevitably miss the rich background of each case. They worried that Eisenhardt's approach would not evoke as much new and better theoretical insights as has the "classical", more qualitative, free-form case study (Dyer & Wilkins, 1991). It seems that Eisenhardt positioned the case study between quantitative positivism and qualitative interpretive paradigm. By situating the case study in the hypothesis-testing model, Dyer and Wilkin argued that Eisenhardt shifted the case study to the opposite

direction from its original and most powerful function of building ground-breaking theory.

The case study has several advantages. First, it is flexible. Researchers are free to discover and address issues as they arise in their analysis. The flexibility also allows researchers to begin with relatively broad research question and narrows down their focus during the process. This feature is especially suitable to policy research given the complexity of the social problem and unpredictability of the policy outcome. Second, the case study emphasizes context. The qualitative research tradition generally believes that there is no universal law in social study. Context is the key to understand any social phenomena. The case study is well situated in this tradition by focusing on "deep data" or "thick description". The case study stands between abstract theories and concrete real-world examples. It supports or questions the abstract theories with rich-context examples. It can also build new theories from scratch. Theories built upon a case study are more likely to be empirically valid compared to other research methods because the theory building process itself is so intimately tied with evidence (Eisenhardt, 1989).

There are also weaknesses. The greatest concern is the lack of rigor of case study research. It is not uncommon that case study investigators have not followed systematic procedures, or have allowed equivocal evidence or biased views to influence the direction of the findings and conclusions (Yin, 2003). In addition, case study is often considered incapable of providing an adequate basis for scientific generalization (Yin, 2003). The intensive use of empirical evidence might yield a theory which is overly complex and lacks the simplicity of overall perspective (Eisenhardt, 1989). Third, if not implemented

properly, the case study often takes too long and results in massive, unreadable documents (Yin, 2003).

### **3.2.2 Collection and Analysis of Data**

#### **3.2.2.1 Collection of Data**

This study follows Yin's three principles to collect data:

1. use multiple sources of evidence;
2. create a case study database;
3. maintain a chain of evidence (Yin, 2003, pp. 97-104).

Following Yin's principle, this study uses multiple sources of evidence to ensure the validity of the study. Data collection preparation begins with a thorough literature review on theories of regulation, Chinese characteristics and regulatory models. The literature review contributes both to the building of the research framework and to the identification of the appropriate variables and data sources. The data primarily comes from three sources: scholarly research (in English and Chinese), trade magazines (in English and Chinese) and government documents (mainly in Chinese). No formal interviews were conducted. However, speeches of top executives and officials, as well as other influential persons, regarding the subject matter were included.

It must be noted that one must be very cautious in regard to the validity and reliability of these secondary data, given that not all of them can be obtained from official authorities and established independent resources. Manipulation of statistical data is not a

very rare phenomenon in either China or other countries. Consequently, rival interpretations of the same data are possible by different entities. Those questionable data sources might constrain the development of a proper regulatory framework. However, as policy making itself is a highly controversial process, with careful scrutiny, those debatable data are relevant, if not necessary, to this study.

### **3.2.2.2 Analysis of the Data**

Analyzing case study data is especially difficult because the strategies and techniques have not been well defined (Yin, 2003). Yin presents three strategies for case analysis. The most preferred one is to rely on theoretical propositions. In the absence of theoretical propositions, the alternative one is to think about rival explanations. Then the least preferred one is to develop a case description (Yin, 2003). Specifically, Yin suggests five analytic techniques, namely pattern matching, explanation building, time-series analysis, logic models and cross-case synthesis. Yin goes on to present principles related to data analysis and evaluation:

1. Show that the analysis relied on all the relevant evidence;
2. Include all major rival interpretations in the analysis;
3. Address the most significant aspect of the case study;
4. Use the researcher's prior, expert knowledge to further the analysis (Yin, 2003, pp.137-138).

The analysis of the data in this study will follow the principles mentioned above. Particularly, given the complexity and controversy of policy-making, focus will be put on

the inclusion of all major rival interpretations and addressing the most significant aspects of the cases selected.

A good qualitative study is flexible and open-ended. During the course of this research, the author takes changing contexts and emerging issues into consideration. The author does not oppose the “subjectivity” of the qualitative approach. On the contrary, bearing in mind there is no such absolutely “right” or “wrong” policy, diversified views lead to the kind of policy that avoids both absolutism and agnosticism

### **3.3 Limitations and Exclusions**

The study is a limited inquiry given the lengthy body of materials and difficulty in obtaining valid and reliable data. Because of deregulation, a great amount of previously publicly available data has become proprietary. Furthermore, official statistics in China are usually not thorough and current. Commercial databases might be available but at a high price. Since this study relies heavily on secondary resources, the validity and credibility of those data might vary. In addition, given the nature of case studies, the subjectivity of the researcher might also intervene in the research process.

The study will focus on the study of the theoretical regulatory model of China’s telecommunications and avoid proposing a detailed section-by-section telecommunications law. The literature to be reviewed and data to be used will be strictly restricted within the scope of the investigation stated above. However, a historic review of telecommunications development in China, an analysis of the international experience, and an overview of the state-owned enterprises reform that is now taking place in China

is also necessary for developing a valid theoretical framework for the analysis of China telecommunications regulatory regime. The author also assumes that there shall be no radical change in China's political regime, which is highly unlikely, in the next decade. The model proposed in this dissertation aims to steer the Chinese telecommunications on the sustainable path within the current institutional constraints. Thus, emphasis is given the applicability of the model. There are, however, inquiries that are related to but beyond the scope of this study. Some issues that this study will not address are as follows:

- The evolution of China's political regime and its impact on telecommunications policy;
- Ideological related issues including content regulation;
- The relationship of telecommunications and general economic development;
- Globalization and its influence on China;
- The demand analysis of China's telecommunications customers;
- The economic analysis of specific regulatory policy

## Chapter 4

### OVERVIEW OF CHINA'S MODERN TELECOMMUNICATIONS: HISTORY AND CURRENT DEVELOPMENT

We have examined the application of techniques for sending [information] via copper wires in China, and found that they are extremely inconvenient; therefore, they can never be introduced.

--Prince Gong to the Russian Minister, L. de Balluseck<sup>17</sup>, 1865

#### 4.1 From "Lightning Wires" to "Information Super Highway"

The essentiality of communications to defense, control and integrity was well understood by Qin Shihuang, the first Emperor of the Qin Dynasty. After unifying China in 221 B.C, Qin Shihuang ordered the world's first centralized and unified post delivery system set up all over the country. The "Post Delivery Law" of the Qin Dynasty is believed to be the first government regulation about communications (State Postal Bureau of China, 2000). Interestingly, 2000 years later, the emergence of modern telecommunications was considered by the Qing Dynasty as a potential threat to the government's authority.

##### 4.1.1 The Introduction of the Telegraph

The growth of trade with Western colonists after the Opium War in 1840 created a huge potential market for modern communications services. Fearing foreign aggression

---

<sup>17</sup> Excepted from Baark (1997, p.69).

and domestic insurgence, the Qing Dynasty rejected all initiatives related to the construction of telegraph lines on land in the beginning<sup>18</sup>. However, its resistance failed to stop foreigners' attempts to erect telegraph poles in China. On December 8, 1870, Great Northern, a Danish company, quietly laid its cable along the western bank of the Woosong River, Shanghai, which marks the start of China's modern telecommunications (Baark, 1997).

In 1883, telephone service was introduced by Danish businessmen. Later, the Qing court took it over, established a regulatory office in 1906, and began to construct some state-run facilities (Zhou, 1997). When the Qing Dynasty was overthrown in 1911, limited telephone service was available in some big cities. Prolonged wars and unstable political conditions significantly impeded the development of China's telecommunications. Little headway had been made by the time the Communist Party took office in 1949. In 1949, with an exchange capacity of 310,000 lines, there were 300,000 phones in use for about 550 million people. Moreover, most of the telephones were installed in central cities (Zhou, 1997). Only 76975 kilometers of copper lines were installed nationwide. Shortwave radio was the primary means of communication between Beijing and provincial capitals (National Bureau of Statistics of China, 1999). Furthermore, most of the telephones in the countryside were for military purposes, leaving virtually no telephones for residential use.

---

<sup>18</sup> The overriding concern of the Qing Dynasty in the late 1860s was to regain political control after the Opium War and the Taiping uprising. The dominant conservative leadership considered new communications technologies, represented by the telegraph, to be a potential threat to the Qing court because it enabled its enemies to communicate better. For details, see Baark (1997).

#### **4.1.2 1949 to 1980: Slow Progress**

Though seasoned in wars, the Communist Party was not yet ready to build up and run a modern telecommunications network in a vast and poor country. Facing the pressures from the Nationalist Party that fled to Taiwan and international capitalist forces, the young Chinese government chose to focus its limited resources in agriculture, heavy industry and the military. For the first 30 years, telecommunications had been the slowest sector in the national economy (D. Lu & Wong, 2003). From the 1950s to the 1970s, the management of China's telecommunications was semi-military and highly centralized. Telecommunication was mainly considered as a tool for administrative and military needs. Having home telephone service was a political privilege and a symbol of social status (D. Lu, 1994).

Nevertheless, the one-month-old government established the Ministry of Posts and Telecommunications (MPT) to supervise telecommunications and postal service on November 1, 1949. Soon afterward, posts and telecommunications bureaus were established at regional, provincial, and municipal levels. In 1958, as the country swirled in a mass movement of decentralization, provincial posts and telecommunications bureaus became a department of the local government, leaving the MPT only responsible for inter-province coordination of network operations and management. The decentralization provoked tremendous chaos and severely damaged national coordination, which later forced the government to reinstate MPT's monopolistic position in 1962 (Wan, 2001). During the chaotic Cultural Revolution from 1966 to 1976, the MPT was once abolished in 1969. Postal service was merged into the Ministry of Transportation

and the telecommunications sector was taken over by the People's Liberation Army. However, only four years later, the MPT was reestablished with limited control over technical aspects of the telecommunications business. Decision-making power in personnel, financing, and the administration of posts and telecommunications bureaus at and below the provincial level remained at provincial level (Zhou, 1997).

Modest progress was made in the 4 years after 1976, especially in long-distance transmission.

As shown in Table 4-1, major sectors achieved double-digit growth during this period.

Table 4-1: Growth of China's Telecommunications Industry, 1976-1980

	Total Length of Long-distance cable (kilometer)	Telephone Penetration	Number of City Telephones (million)	Long Distance Telephone Lines (line)	Total Long Distance Public Exchange Capacity/Automatic Exchange capacity (line)
1976	4590	0.33	1.5	16066	4320/0
1980	8019	0.43	2.8	22011	7085/1969
Growth Rate (%)	74	30	86	37	64/n/a

Sources: Data compiled from He (1997, p.74).

Though those accomplishments appear to be impressive, telecommunications was in fact significantly outpaced by other sectors. The government investment in posts and telecommunications was trivial. During 1976 to 1980, posts and telecommunications only accounted for 0.8 percent of the government's national plan (T. Liu, 1988). Since the public telecommunications system under the MPT could not meet the growing demand from other ministries, starting in 1976, several ministries began to construct their own private networks for internal needs. Those networks, together with the existing military

and railway telephone networks, later became a major threat to the MPT's dominance (Zhou, 1997).

#### **4.1.3 Prepare for Take-off: 1981 to 1990**

When Deng Xiaoping finally stabilized the political struggle in 1980, the “four modernizations” became the number one priority of the Chinese government. The door was opened and the market mechanism was introduced into many sectors. The fast growing economy required a sophisticated, modern and nationwide telecommunications system. After being ignored for nearly three decades, telecommunications and its potential contribution to economic growth became a focus of the Chinese government officials and scholars. Chen Yunqian, the director of the Economic and Technological Development Research Center of the MPT, published an article in which he quoted Hardy's research indicating that a 1 per cent rise in the number of telephones per 100 inhabitants could contribute to as much as a 3 percent increase in gross domestic product (Y. Chen, 1990).

The telecommunications industry experienced a quick takeoff during this period. In the Sixth Five-Year Plan (1981-1985), telecommunications was made a development priority for the first time.

Transportation, postal service and telecommunications are a conspicuously weak area in the current economy. In the Sixth Five-Year Plan period, a concerted effort should be made to reinforce the construction of these industries, to improve their management and to raise their capabilities and efficiency so that they can meet the needs for energy, drive, and stable economic growth. (The Sixth Five-Year Plan, 1983, p. 360)

A series of preferential policies were made to help jump-start the telecommunications industry:

- The leadership of the MPT was reinforced. In 1980, the State Council decided to put provincial posts and telecommunications bureaus under the dual leadership of the MPT and the local government, with primary duty assigned to the MPT. The dual leadership system made it possible for the central government to concentrate, reconcile development objectives and mobilize limited resources (Wan, 2001);
- The telecommunications industry was given a special policy called “three reversed 90 percent”. The telecommunications industry could keep 90 percent of its profit<sup>19</sup>, retain 90 percent of its foreign currency income from non-tradable transactions; and was exempted from repaying 90 percent of the state loans<sup>20</sup> (Wan, 2001);
- The MPT was allowed to charge an installation fee beginning in the early 1980s. The installation fee was set at as high as RMB5000<sup>21</sup> which was extremely high in that period. The installation fee helped the telecommunications industry to accumulate a relatively large amount of cash flow during that period. Wan found that the installation fee and other

---

<sup>19</sup> Other types of industry generally could only keep 55% of their profits.

<sup>20</sup> In the planned economy, government investment was considered like bank loans. 90% exemption meant that the P&T industry basically got free investment from the Chinese government.

<sup>21</sup> In the 1980s and early 1990s, the average monthly income for a typical working class family in Beijing was around 1000RMB.

surcharges accounted for nearly 50 percent of total telecommunications investment during the 8<sup>th</sup> Five-Year Plan (1991-1995) (Wan, 2001);

- Some administrative restructuring also took place. In order to encourage them to invest in telecommunications construction, the MPT granted significant decision power to its provincial bureaus. 31 provincial level P&T bureaus signed contracts with the MPT and started their own accounting system, under which revenues from local services were all kept by local bureaus<sup>22</sup> (Zhou 1997; Wan 2001).

#### **4.1.4 The Great Leapfrog: since the 1990s**

The huge investment and preferential policies made in the 1980s laid the foundation for the great leapfrog of China's telecommunications in the 1990s. However, the initial rapid growth did not resolve the institutional pitfalls of the old Posts and Telecommunications system. The MPT was criticized for its low productivity and poor management performance. Early government policies had achieved its goal to jumpstart the industry in the 1980s. More radical reforms were called for to develop this sector further in order to meet the challenges of the advancement of technology and the globalization of the economy.

---

<sup>22</sup> While this decentralization helped to improve efficiency and streamline bureaucracy, it also had negative long-term effects on China's telecommunications market structure, which we shall discuss further in the following chapters.

#### 4.1.4.1 Restructuring the Telecommunications Industry

In order to meet the huge demand for value-added services and facilitate the MPT enterprises to improve their management standard and quality of service, the Chinese government opened value-added services, such as paging, 450 Mhz wireless access, electronic mail, etc., for competition at the beginning of 1993 (Wan, 2001). China Unicom was also founded as a joint venture of several powerful government ministries, mainly the Ministry of Electronics Industry (MEI), the Ministry of Railway (MOR) and the Ministry of Electricity (MOE), hoping to introduce competition into the domestic telecommunications industry in 1994<sup>23</sup>. Within the MPT, the operation of the public telecommunications system was separated from other parts of the Ministry. In April 1995, the “China Directorate General of Telecommunications” was officially registered as a company called China Telecom. It is worth noting that China Telecom was not a real company, rather an administrative agency representing provincial telecommunications bureaus at the MPT. Provincial bureaus reported directly to the MPT (Y. Xu & Liang, 2001).

China Unicom’s entry hardly threatened China Telecom’s monopoly position. Unicom was believed to be ill-treated by the MPT, which was both the regulator and the dominant operator. Five years after its inauguration, in its strongest wireless sector, China Unicom only signed up 1 million users by the end of 1998, less than 5 percent of China Telecom. The Chinese government began to consider a major restructuring of China’s

---

<sup>23</sup> It is argued that the introduction of Unicom is primarily a product of competition between government bureaucracies over economic turf rather than a part of Western style sector liberalization program (Mueller & Tan, 1997).

telecommunications industry (Wan, 2001). After lengthy debates<sup>24</sup>, on February 14, 1999, the State Council announced the plan to divide China Telecom into four companies, China Telecom (responsible for fixed service), China Mobile (responsible for cellular service), Guoxin Paging (responsible for paging service, which was later merged into China Unicom) and China Satellite (responsible for satellite service). After the divestiture, China Unicom began to strengthen its operation in the cellular market and later became the primary competitor of China Mobile. 1999 also saw the establishment of China Netcom, which was set up by the Chinese Academy of Science, Ministry of Broadcasting, Film and Television, Ministry of Railways and Shanghai City Government and headed by Jiang Mianheng, who is the son of President Jiang Zheming. China Netcom aimed to build a nationwide all-IP network and become the so-called “carrier of carriers”.

Hoping to further bring competition in the fixed market, in 2003, China Telecom was divided geographically into two companies: the new China Telecom took the southern provincial branches of the former China Telecom, and the new China Netcom inherited the northern provincial branches. As a result, in both the landline and wireless markets, there are at least two competitors. Figure 4-1 depicts the evolution of China’s telecommunications industry.

---

<sup>24</sup> The debates centered on three issues: whether to have a second backbone network; whether to permit cable TV companies to enter the telecommunications service market; whether or how to divide China Telecom into smaller companies (Wan, 2001).

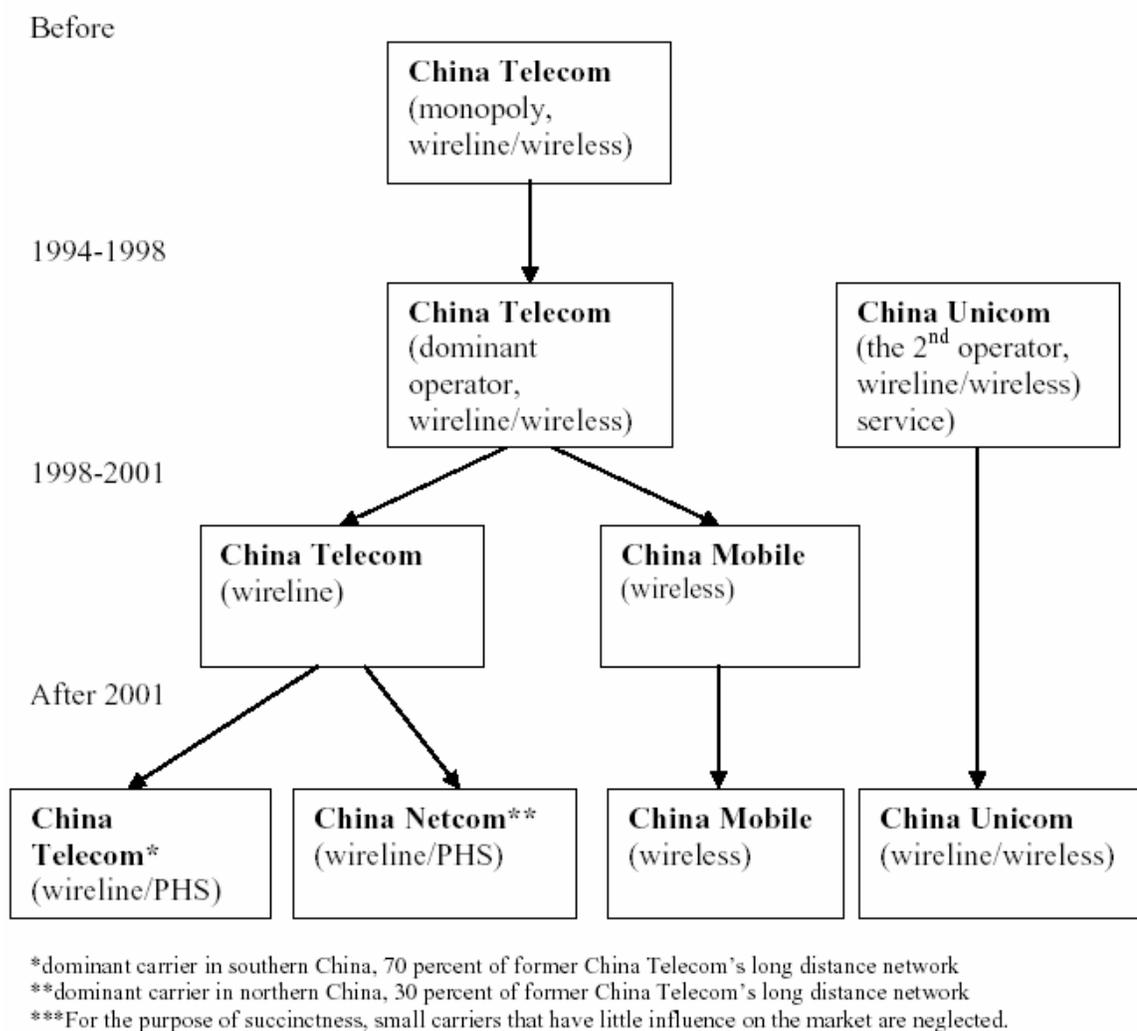


Figure 4-1: Major public telecommunications operators in China\*\*\*

#### 4.1.4.2 Restructuring the Regulatory Regime

Before 1994, the MPT was both the regulator and operator. It was not surprising that the former China Telecom, that was part of the MPT, received favorable policies and regulations from the MPT during that period. Gradually, tensions built up between China Telecom and the newly-created China Unicom, as well as their respective parent

government ministries. In preparation for further economic reform, the Chinese government launched a new large-scale government restructuring in 1998. The MII was created by merging the MPT, MEI and part of the Ministry of Broadcasting, Film and Television (Figure 4-2 depicts the evolution of the regulatory agencies). Supposedly, the MII is a super-agency that oversees telecommunications, multimedia, broadcasting, cable, satellites, and the Internet (See Table 4-2 for a description of the MII's mission statement). In practice, the MII's authority has never extended to the radio, broadcasting and cable industries, which are more ideology-sensitive<sup>25</sup>.

---

Table 4-2: Selected Responsibilities of the MII

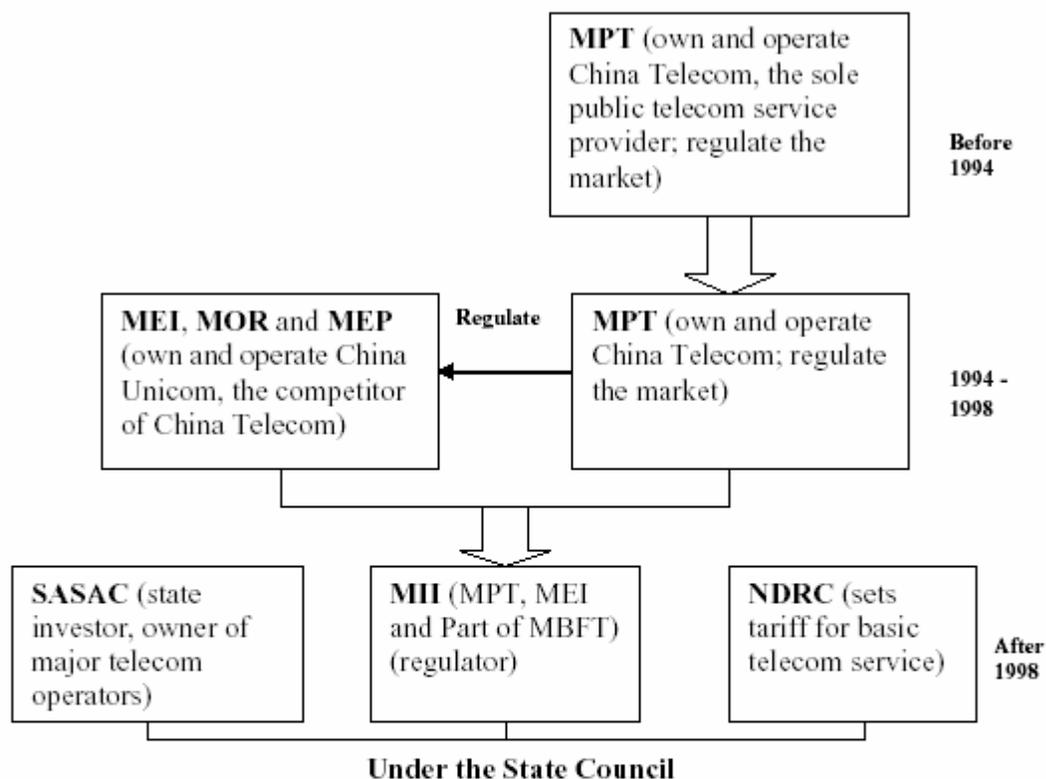
- |   |
|---|
| <ul style="list-style-type: none"> <li>• Formulating development strategies, policies, laws, regulations, plans and technical criteria for the information industry, the public telecom network, the radio and television network, and military networks.</li> <li>• Approving telecom networking and terminal equipment and supervising product quality.</li> <li>• Allocating and managing radio frequency resources, satellite orbit positions, telecom network codes, domain and Web site resources, approving the establishment of radio stations, and monitoring radio operations.</li> <li>• Ensuring fair competition in the telecom and information service markets and promoting service quality, approving telecom and information service licenses, drafting regulations for interconnection and the settlement of telecom networks.</li> <li>• Regulating telecom service fees.</li> </ul> |
|---|

Source: compiled from

[http://www.chinaonline.com/refer/ministry\\_profiles/MIIB3.asp](http://www.chinaonline.com/refer/ministry_profiles/MIIB3.asp)

---

<sup>25</sup> The State Administration of Radio, Film and Television regulates China's media industry in coordination with Ministry of Culture and the Communist Party's propaganda department.



MPT: Ministry of Posts and Telecommunications  
 MEI: Ministry of Electronics Industry  
 MOR: Ministry of Railway  
 MEP: Ministry of Electrical Power  
 SASAC: State-owned Assets Supervision and Administration Commission  
 MII: Ministry of Information Industry  
 NDRC: National Development and Reform Commission  
 MBFT: Ministry of Broadcasting, Film and Television

Figure 4-2: Evolution of China's Telecommunications Regulatory Regime

The direct effect of the formation of the MII was the strengthening of China Unicom. In March 1999, the MII ordered the transfer of all the existing CDMA networks<sup>26</sup> to China Unicom. Later, China Unicom was licensed to build a nationwide

<sup>26</sup> The People's Liberation Army operated a small-scale CDMA network at that time.

CDMA network. On 20 May 1999, Guoxing<sup>27</sup>, being split from China Telecom only two months ago, was merged into China Unicom. The absorption of Guoxing almost tripled Unicom's revenue for that period. The MII also supported Unicom by sending senior government officials.<sup>28</sup> Since 1998, Unicom has been the only operator with licenses to offer all kinds of telecommunications services. Another measure the MII took immediately was finalizing the separation of posts and telecommunications. By the end of 1999, the separation was completed with the promise of the MII to subsidize the postal service by a certain amount of money from telecommunications for the first several years.

#### **4.1.5 The Information Superhighway**

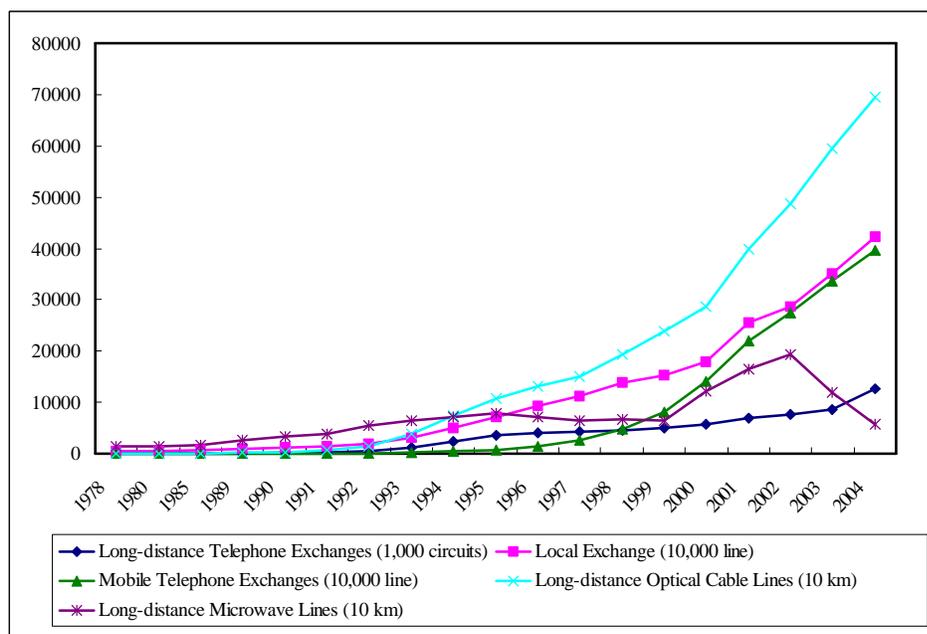
##### **4.1.5.1 Infrastructure**

As depicted by Figure 4-3, various preferential policies in the 1980s dramatically facilitated the take-off of China's telecommunications. Throughout the 1980s, telephone exchange and transmission capacities doubled every year. In the 1990s, optical fiber gradually replaced microwave in long-distance lines. The capacity of mobile exchanges was catching up with that of local exchanges during this period. Table 4-3 presents key indicators of China's telecommunications infrastructure.

---

<sup>27</sup> Guoxing was the largest paging service provider with RMB2.25 billion revenue for the first quarter of 1999. China Unicom only had RMB 740 million for the same period (Wan, 2001).

<sup>28</sup> A former vice minister of the MII was appointed as the chairman of the board of Unicom.



Source: State Statistical Bureau, China (State Statistical Bureau, 2005)

Figure 4-3: Development of Communications Capacity

Table 4-3: Key Indicators of Telecommunications Capacity as of 2005

Indicator	Unit	
Fixed Network Long Distance Transmission Circuit	2M	283920
Mobile Network Long Distance Transmission Circuit	2M	422855
Optical Fiber	KM(kilometer)	4049872
Long Distance Exchange	10 Thousand	1338.8
Local Exchange	10 Thousand	46954.3
Mobile Exchange	10 Thousand	48282.5
Broadband Access Port	10 Thousand	4835.9

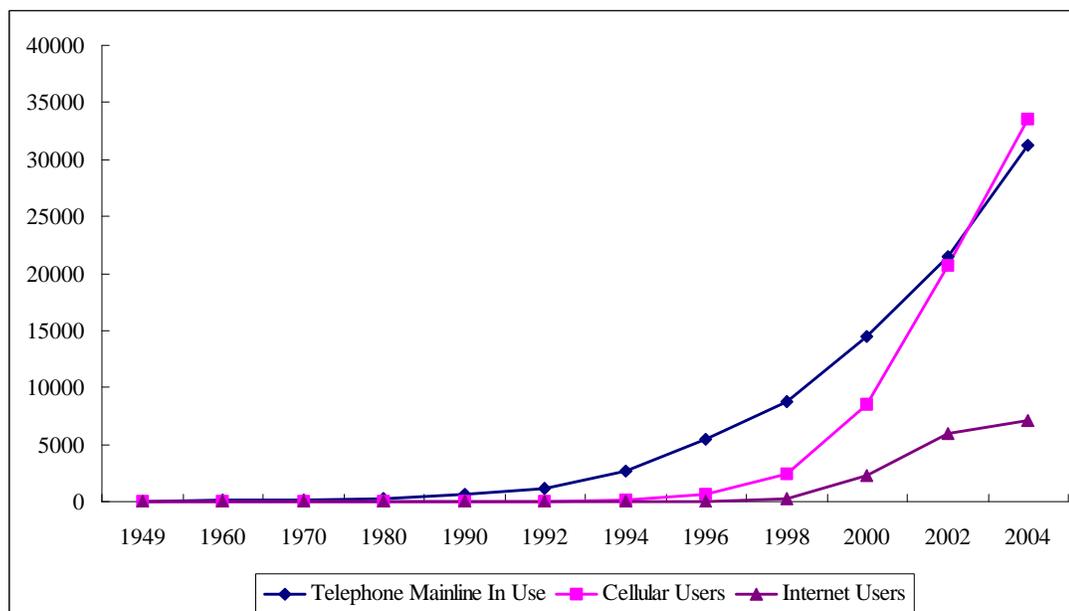
Source: The Ministry of Information Industry  
[http://www.mii.gov.cn/art/2006/02/24/art\\_166\\_6928.html](http://www.mii.gov.cn/art/2006/02/24/art_166_6928.html)

#### 4.1.5.2 Services

The infrastructure built during the 1980s laid the foundation for the booming telecommunications industry in the 1990s. In 20 years, China has hooked up 353 million wireline and 399 million wireless subscribers, up from almost zero<sup>29</sup>. It is highly likely that China will have more than 500 million wireline and wireless users by the end of this year, more than the total population of the United States. As depicted by Figure 4-4, the number of wireless subscribers has exceeded that of wireline service. With a view to the potential issuing of 3G licenses in this year, it is expected that the wireless industry will experience another round of rapid growth. The number of Internet users has also doubled every year after 1998. The newest statistics from the MII shows that the majority of new Internet users use broadband technologies.

---

<sup>29</sup> Data as of Jan 2006, according to the MII's monthly report.



Source: Statistical Yearbook of China 1984, China Statistical Yearbook 2005, ITU, MII

Figure 4-4: Number of Subscribers

## 4.2 Overview of China's Modern Telecommunications

### 4.2.1 Market Structure

In each sector, there are at least 2 competitors. In the local telephone market, China Telecom and China Netcom are the two dominant carriers in North and South China. While they are expected to enter each other's territory, little progress has been made. China Unicom also has a license to provide local telephone service, but their service is limited to several major cities and their market share is very small. In cellular service, China Mobile competes intensively with China Unicom. China Telecom and China Netcom also operate a quasi-mobile service called PHS in most cities across China.

In the long distance service market, the price has dropped dramatically since the introduction of IP telephony. However, in the traditional long distance market, China Telecom and China Netcom are still the dominant carriers. Table 4-4 depicts the market structure of China's basic telecommunications services. There are two other small carriers in the market: China Railcom and China Satellite<sup>30</sup>. China Railcom primarily provides wireline service along railway lines. China Satellite specializes in satellite communications.

Table 4-4: T Market Structure of China's Telecommunication Industry

Major Operators	Local Telephone License/Service Areas	Long Distance License/Service Areas	Cellular Service License/Service Areas
China Telecom	Yes/South (21 Provinces)	Yes/National Coverage	No/Operates PHS in many cities
China Netcom	Yes/North China (10 Provinces)	Yes/National Coverage	No/Operates PHS in many cities
China Mobile	No/No	Yes/National Coverage	Yes/GSM National Coverage
China Unicom	Yes/Limited to several cities	Yes/National Coverage	Yes/GSM and CDMA National Coverage

China's telecommunications operators could not be understood without taking the so-called "Chinese characteristics" into consideration. Although all the major Chinese telecommunications operators are state-owned, unlike traditional state-owned enterprises, telecommunications operators are injected with many "market" ingredients. All the big three, China Telecom, China Mobile and China Unicom, are listed in foreign stock

<sup>30</sup> Their market share is very small compared to the big 4 carriers.

markets, including Hong Kong and New York exchanges. China Unicom is also listed in the domestic stock market, Shanghai Exchange. Thus, those companies are no longer only responsible to the government, but also to domestic and foreign investors.

More specifically, there are two interesting, but important, characteristics worth consideration. First, competition among the Chinese telecommunications operators may not make economic sense. State enterprises usually are less sensitive to the cost of production than private companies. In China, the most common type of competition in the telecommunications industry is conventionally known as “price war”, in which operators cut their prices fiercely. Lacking modern accounting and auditing systems, it is difficult for the state, as well as the operators themselves, to monitor the real cost.

Second, the management structure is decentralized. Local branches have substantial flexibility in making their own investment plans. In China, local telephone networks are managed at the local exchange level; intra-province long distance networks are managed at the provincial level, while inter-province long distance networks are managed at the national level. This three-layered model worked well in the old PTT era when the whole system was owned, operated and regulated by the former MPT. In the late 1980s, in order to encourage provincial and local governments to participate in the economic reform, the central government decentralized many of its decision powers. Since then, local and provincial telecommunications branches were allowed to keep most of their profits from local and intra-province services. Thus, local and provincial branches have strong incentives to generate revenues from locally-centered services.

## **4.2.2 The Regulatory Regime**

In order to understand China's telecommunications policy making process, it is important to have a clear picture of China's complicated political system. It must be highlighted that the function of the Communist Party often intertwines with that of the government. In addition, the authority of different ministries might overlap with each other. Furthermore, under current political arrangements, some administrative powers are shared by central and local governments.

### **4.2.2.1 The Chinese Communist Party: the Super Power**

At the top is the Communist Party, which sets out national fundamental policies, guidelines, procedures, and directions. The Chinese government must formulate policies in accordance with the Party's overall framework. The Party also has the authority to appoint and remove the most important personnel of ministerial departments as well as state-owned enterprises such as China Telecom and China Unicom. Therefore, the Party has been, and will be, playing the directive role in telecommunications policy making and other industrial reform in China.

### **4.2.2.2 The National People's Congress: the Legislative Body**

China lacks formal and independent legislative and judicial systems. The National People's Congress and its Standing Committee exercise the legislative power. However, the unique position of the Party in the People's Congress makes the legislative process in

China inherently different from that of the West. Furthermore, being regarded as the enforcement branch of the Party, China's judicial system has never been independent. Although the Chinese government has launched the so-called 'legalization' campaign, the effect is limited. However, some recent evidence shows that the National People's Congress has begun to show off its power by criticizing the government and vetoing its proposed developmental plan and annual report<sup>31</sup>. It looks like the Party is willing to give up some controls as long as political reform improves economic and bureaucratic efficiencies and does not threaten its leadership.

#### **4.2.2.3 The State Council: the Executive Body**

The State Council, the head of the executive branch, is playing an increasingly important role in policy-making. The MII is directly responsible to the State Council and obligated to implement rules and decisions made by the State Council. The State Council deals with general issues and different ministries set up administrative orders respectively for their own sector. However, in telecommunications, it is not rare that the State Council coordinates with several ministries and enacts regulations directly. However, we should not underestimate the Party's influence on the State Council. Although, supposedly, the Party is now gradually retreating from routine government affairs, in reality, the

---

<sup>31</sup> A recent example is the controversial passage of the Three Gorges Dam Project on the Yangtze River, with 1767 for, 77 against, and 664 abstentions (J. Wang, 2002).

separation of the Party from the government is far from complete<sup>32</sup>. Almost all the top and middle government officials are members of the Party.

#### 4.2.2.4 Ministries and Commissions

The MII is the regulator in telecommunications. However, the MII needs to work with other government agencies, the most important among which are the State-owned Assets Supervision and Administration Commission<sup>33</sup> (SASAC) and the National Development and Reform Commission (NDRC).

The SASAC takes the responsibility of the State investor. Since all Chinese telecommunications operators are state-owned enterprises, they are directly under the supervision of the SASAC. The SASAC does not manage and operate state-owned enterprises directly. Rather, it exercises its influence in two ways. First, the SASAC can directly “dispatch supervisory panels to some large enterprises on behalf of the state and take charge of daily management of the supervisory panels”; second, it can also “appoint and remove top executives of enterprises, and evaluate their performances through legal procedure”<sup>34</sup>. For example, the reshuffle of the top executive personnel among major operators in November 2004 is believed to be a strong measure by the SASAC to adjust

---

<sup>32</sup> As a matter of fact, all ministers are the members of the Political Bureau or Central Committee of the Party. In fact, the Political Bureau, the Party’s highest policy making body, is functionally organized to parallel the government ministries, with members specializing in the various governmental activities (J. Wang, 2002).

<sup>33</sup> Founded in 2003.

<sup>34</sup> Quoted from the SASAC’s official website, mission statement

the “unhealthy” competition in the Chinese telecommunications industry<sup>35</sup> (“Three Chinese telecom carriers rumored to swap CEOs”, 2004). One of the most important missions of the SASAC is to “supervise and administer the preservation and increment of the value of state-owned assets”. Theoretically, if competition causes the major telecommunications operators to lose “the value of state-owned assets”, then the SASAC should intervene in order to “preserve” and “increase” the “value of state-owned assets”.

The NDRC is authorized by the State Council to “formulate pricing policies, regulate the general price level and the prices of major state-controlled commodities and standardize fees”. Basic telecommunications services, including wireless and wireline voice telephony, fall under the NDRC’s scrutiny. In the old PTT model, it was unnecessary for the NDRC to be involved in telecommunications pricing regulation. However, since the MII is supposed to be independent of any telecommunications carriers and, more importantly, the MII does not have administrative authority to carry out its own orders pertaining to pricing under the current political system, the MII needs to coordinate with the NDRC to set prices for basic service, prohibit illegal pricing, etc.

The SARFT is the regulator of China’s broadcasting and television industry. Since 1949, television networks and telecommunication networks have been regulated by different government agencies. With the advance of new digital technologies, both TV networks and telecommunication networks are able to provide high-speed broadband services. Both networks and their regulators are trying to maintain monopoly power over their traditional service domains and, at the same time, trying to penetrate into each

---

<sup>35</sup> There has never been any official statement from the SASAC regarding this decision.

other's area. In 1999, State Council Decree 75 reiterated the national ban on network convergence. Since then, no license has been issued to television/cable/radio companies to offer telecommunication services by the MII, and the SARFT has also strictly prohibited telecommunication carriers from entering the television market.

### **4.2.3 Formal Legislation on Telecommunications**

China did not have a formal set of telecommunications regulations or laws until the late 1990s. One significant step that the MII took after its establishment was paying great attention to drafting new regulations in order to meet prospective international competition. In September 1999, the MII issued the "Temporary Regulation on Telecommunications Network Interconnection." This regulation includes 10 chapters and 51 articles, and covers most of the important issues concerning network interconnection. More importantly, a formal telecommunications regulation, the "People's Republic of China Telecommunications Decree" was issued by the State Council and became effective in September 2000. The Decree consists of 6 chapters and 79 articles, which cover most of the important issues regarding telecommunications resources allocation, network interconnection, licensing, safety, arbitration and so on. Though it is far from complete, China's Telecommunications Decree has reduced regulatory uncertainty and improved transparency to some extent. In addition, shortly after China's accession to the WTO, the State Council issued "Provisions on the Administration of Foreign-Invested Telecommunications Enterprises" (Decree No.333), which became effective on January 1, 2002. Consisting of 21 articles, the Decree No.333 is formulated in accordance with other

relevant laws and administrative regulations governing foreign investment in order to meet the needs of opening up the telecommunications industry.

#### **4.2.4 Other Institutions**

##### **4.2.4.1 Interested Parties and Public Opinion**

Interested parties and public opinion play their roles primarily via bureaucratic bargaining and public criticism. Lieberthal (1992) argues that bureaucratic bargaining reflects the existence of fragmented authority. Private bargaining plays a very important role in China's decision-making process and policy implementation. Social network (or Guan Xi in Chinese) is one of the most important informal institutions in China.

Among interested parties, consumers are the most important one.

Telecommunications services, as far as basic voice wireline and wireless services are concerned, have become a commodity in recent years. Twenty years ago, a residential phone was a symbol of political privilege. Ten years ago, a mobile phone was a sign of wealth. Now, basic telecommunication services, particularly in urban areas, have become a necessity just like gas, clean water and electricity. While telephone penetration is steadily increasing, the average revenue per user (ARPU) keeps dropping. Data from the MII shows that the ARPU of landline service dropped from 86.5 RMB<sup>36</sup> per month in 2002 to 71.6 RMB per month in 2004. The ARPU of mobile service dropped from 97.7 RMB per month in 2002 to 75.3 RMB per month in 2004. Given that the average

---

<sup>36</sup> 1\$=8.27RMB

disposable income of an average urban Chinese household in 2004 was only 9422RMB<sup>37</sup>, Chinese customers actually spent a significant portion of their income on telecommunications services.<sup>38</sup> In cellular service particularly, the relatively high monthly subscription fee is still a barrier for many low-income users. It is not rare in China that some customers carry two cellular phones, one for occasional roaming, and the other for taking advantage of low-priced local calling<sup>39</sup>. The existence of a huge number of low-consumers pushes operators to roll out low-priced services. The popularity of short messaging service (SMS) in China not only reflects consumers' demand for personalized service, but is also attributed to its relatively low price compared to regular voice telephony.

Another informal institution is public opinion. However, compared to interested parties, the effect of public opinion seems be sporadic. Public media is one way of expressing public opinion. Though there is heavy censorship imposed on the media industry in China, there are sporadic programs that look at some political issues that are relatively not sensitive. With the development of the Internet, online forums, blogs, discussion boards, etc., cyberspace is becoming an important source of public opinion.

---

<sup>37</sup> Data quoted from *Statistical communiqué of the People's Republic of China on the 2004 national economic and social development*, State Statistical Bureau of the People's Republic of China.

<sup>38</sup> In the US, the median household income in 2004 is \$44,000. The average U.S. household spends a total of \$158.88 on all telecom services each month (TNS Telecom).

<sup>39</sup> See Chapter 5 for a detailed discussion.

#### **4.2.4.2 International Institutions**

Regarding international institutions, globalization, the WTO in particular has tremendous impact on China's economic policy. The WTO, as a rule-oriented organization, is binding its members with rules, principles, and multilateral concepts. The members must take into account the rules and principles of the WTO while formulating domestic policies. Therefore, legally binding rules of the WTO Protocol are able to influence the member countries' domestic telecommunications policies and markets. China is no exception. WTO norms have influenced China's telecommunications regulatory reform and its industrial liberalization. Interestingly, the changes took place even before China's formal entry into the WTO. However, how far China will go in the future will largely depend on "the institutional stances taken by China's government, which is affected by domestic policy constraints and counter-competitive forces in the short run, and determined by political and economic reform in the long run" (Zhang, 2001, p.480).

#### **4.2.5 Regulatory Model**

In terms of a regulatory model, Tan argues that China has chosen institutional convergence in response to technological and industrial convergence brought on by the Internet. He points out that the previous fragmented regulatory regime consisting of several rival governmental agencies has been replaced by the single regulator, the Ministry of Information Industry (1999). However, other researchers find that China's policy environment is still fragmented and any new deregulatory initiative is directed at

neutralizing powerful stakeholders who can block or delay reform (Yu, 2004). Generally speaking, China takes a “silo” approach in regulating telecommunications. The television/cable/broadcasting industry is regulated separately from the telephone industry. In telephone, wireline and wireless services are treated differently. Wireline operators are prohibited from entering the wireless market and vice versa. However, China also integrates layered approach principles into its regulation. The most profound example is the differentiation of value-added service and basic service. Value-added services are open to entry and free to competition while basic services are controlled by the state-owned carriers. In basic services, the Chinese government encourages competition among state-owned carriers, particularly in the long distance market in which cut-throat pricing is often observed. In the local telephone market, efforts have been made to encourage cross-entry, although progress is not satisfactory. In the Internet market, limited competition between state-owned carriers and other enterprises is encouraged in the last mile access market, but the backbone is strictly controlled by the state-owned enterprises. Figure 4-5 presents a general framework of China’s telecommunications regulatory model.

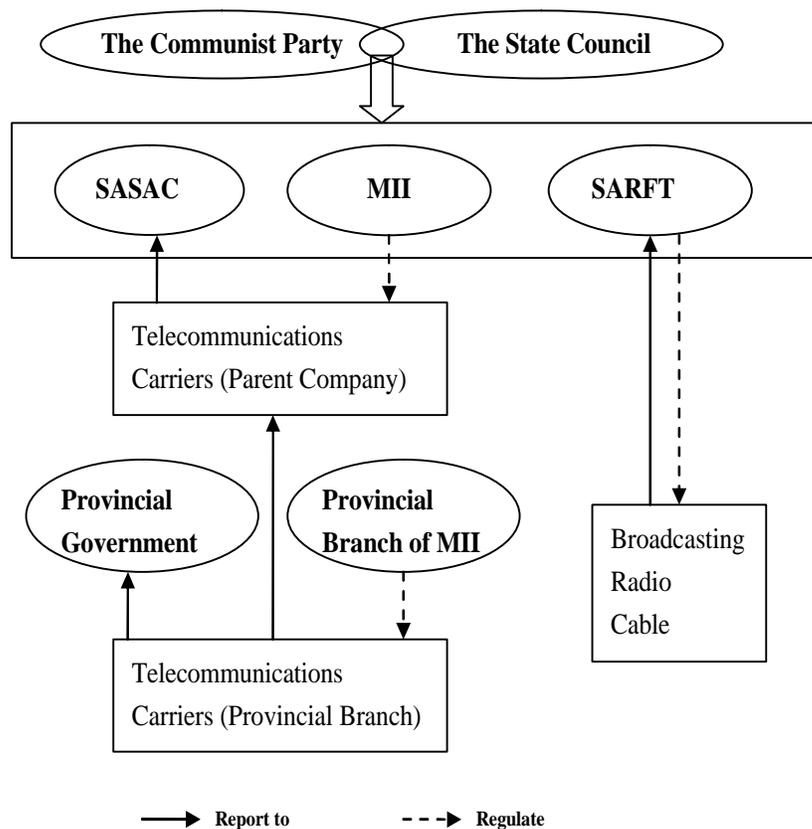


Figure 4-5: Current Regulatory Model

### 4.3 Analytical model

Based on the literature reviewed and discussions above, in this chapter, a general analytical framework is proposed, as depicted by Figure 4-6. It is a very general model. Due to the rapid development of China's telecommunications industry, both the structure of each player and the relationships among them change over time. While there are always different players on the stage, the theme changes little.

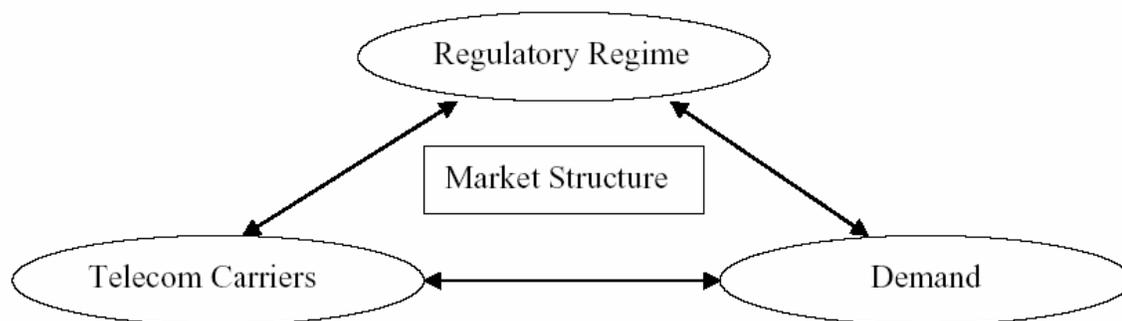


Figure 4-6: Analytical Framework

---

China's telecommunications service market is impacted by three players: government, end users (i.e. demand) and operators. The relationship among those three players and their relative strengths and weaknesses are the key to understanding "telecommunications with Chinese characteristics". In the cases studies which follow, emphasis is put on the analysis of the conflicts and competition among and between those three factors.

In addition, as reviewed in the previous sections, China's telecommunications industry is highly decentralized. Provincial telecommunications branches are under dual leadership of its parent company and provincial government. As a matter of fact, provincial branches are highly flexible in making decisions on their own. The MII's regulation is often ineffective at the provincial level. With respect to that, although the unit of analysis is China's telecommunications industry, the cases studied often go lower to the provincial level. The tensions between provincial and national interest sometimes is another important aspect to understanding China's telecommunications market.

International institutions are not included in the proposed analytical framework. Although the impact of international institutions, such as the WTO, multinational carriers,

etc., should not be underestimated<sup>40</sup>, their influences are usually over-emphasized.

Although major Chinese telecommunications carriers are listed in the foreign stock markets, foreign investors are strictly prohibited from participating in the management of the corporation. There are no signs that multinational carriers intend to go into China's telecommunications services market in the short term. Even with a transparent, fair, independent regulatory regime in place in the next 1 or 2 years, it is still unlikely that foreign companies will rush into China's well-developed service market where competition is already intense.

#### **4.4 Concluding Remarks**

After 20 years' rapid growth, with 340 million wireline and 368 million cellular subscribers<sup>41</sup>, China now has the largest<sup>42</sup> telecommunications market in the world. China's huge domestic market might have triggered the explosive growth in telecommunications. More importantly, the determination of the Chinese government certainly has played a more critical role. As discussed before, although China lacks Western-style legislative and judicial systems, the quasi-autocratic political regime enables the government to concentrate limited resources on its preferred sectors. Telecommunication is only one example. The consistent support from the government

---

<sup>40</sup> The impact of international institutions will be discussed in the case of 3G standards setting.

<sup>41</sup> As of July 2005 according to the statistical data of the Ministry of Information Industry

<sup>42</sup> In terms of the number of subscribers

has helped China's telecommunications industry to achieve an annual growth rate as high as 30 percent in the 1990s.

The absence of telecommunications law, as well as an effective and formal judicial system, implies that effective enactment and implementation of regulations may not be guaranteed. The deep penetration of the Party into the legislative and judicial bodies makes the situation even more complex. In a sense, none of the three prerequisites set by Western neo-classical economists: a well-established market, private property rights and effective rule of law, were met in China. However, in reality, China has attracted a significant portion of global foreign direct investment. Although, due to the strict control of the Chinese government, foreign capital could not enter the basic service market, multinational telecommunications giants have thrown billions of dollars into China's telecommunications manufacturing, value-added services, etc. In fact, the quasi-autocratic political system provides an implicit protection to private property. The Chinese government has promised to protect foreign investment. In a sense, those investments are insured by the Chinese government. In addition, the Chinese government can promise long-term political stability which is also essential for industries requiring long-term investment, such as telecommunications. However, in the long term, as the Chinese economy goes global, policies and regulations will need to be reshaped in tune with the other parts of the world. While foreign investors are learning how to do business in China, the Chinese government is also learning how to comply with international norms.

China's system is officially branded as a "socialist market economy with Chinese characteristics". While the name sounds lengthy, it probably accurately describes China's

unique situation. It is not a text-book type of socialism, nor is it a neoclassical liberalism. In the short term, strong government commitment is likely to continue helping China to maintain a steady growth in telecommunications. However, the ability of the current model of regulation to secure long term sustainability is questionable. Problems have surfaced. In the next several chapters, a series of case studies will be conducted to inquire into the various aspects of China's telecommunications regulation.

## Chapter 5

### PHS: WIRELESS ENJOYMENT AT A WIRELINE PRICE

#### 5.1 Introduction

PHS is short for Personal Handy Phone system. Originally, The PHS' radio standard was developed as the next-generation digital cordless telephone. At present, it is primarily used for general public mobile communication.

Ahn, Kyoung, Duk, & Myoung (2004) argue that PHS is a kind of “bridging telecommunications service<sup>43</sup> (BTS)”. A BTS has two characteristics. First, BTS targets two niche market segments: early adopters who want to experience new technology before the next generation service becomes fully available, and low-end consumers who want to use the service with restricted functionalities but at a lower cost. Second, the life cycle for BTS is relatively short compared with that of dominant telecommunications services. Thus, retention of subscribers is difficult (Ahn, Kyoung, Duk, & Myoung, 2004). Trinkwon (1997) argues that, since PHS, as well as other wireless access technologies, is more cost-efficient for connecting remote areas than traditional local loops, it should be primarily adopted as a “low tier” basic universal service, particularly in rural and poor communities.

---

<sup>4343</sup> The BTS is defined as a stepping-stone service that links the previous generation major telecommunications service to its successor.

Japan launched the world's first PHS system in July 1995 as a low-cost alternative to the then expensive second generation mobile system, with the youth market as its target. The PHS system quickly gained popularity in Japan at an early stage. By 1997, the Japanese PHS providers had attracted 7 million users. A study conducted in Japan in 1995 found that early PHS adopters were younger, richer, more educated and more interested in advanced technologies, such as high-speed data transmission (Ishii, 1996). However, due to the continuously falling rates of other cellular services and some inherent technological shortfalls of PHS itself, many PHS subscribers soon switched to other cellular services. Although the customer base stabilized at approximately 5.5 million from mid 1999 to mid 2002, it has been shrinking since then with no signs of recovery. NTT DoCoMo, the largest PHS operator in Japan, announced that they would not accept any new applications for the PHS service as of April 30, 2005, citing the change in cheaper mobile phone packages and the wider range of mobile phones now available (Leslie, 2005).

While many industry observers have been quick to write off PHS, it has seen resurgence in many emerging markets, such as Chinese Taipei, Thailand<sup>44</sup> and China. In Taiwan, FITEL, the only PHS carrier, had signed up over 1.1 million users by the end of 2005, 4 years after it debuted PHS service in 2001. FITEL forecasts that the number will increase to 1.4 million by the end of 2006 (Y. Wang & Hwang, 2006). FITEL's rapid growth is remarkable because Taiwan already has the highest wireless penetration in the

---

<sup>44</sup> According to PHS MoU, an international open association consisting of telecommunication carriers, service providers, equipment manufacturers, technology providers, telecom authorities, public organizations and so on involved in or interested in PHS business, Thailand had 500 thousand users as of September 2004 (see [http://www.phsmou.or.jp/world/sub\\_statistics.aspx](http://www.phsmou.or.jp/world/sub_statistics.aspx)).

world<sup>45</sup>. China has overtaken Japan as the world's largest PHS market. According to the MII, some 85 million users had signed up the PHS service as of December 2005, up from zero in 1998<sup>46</sup>.

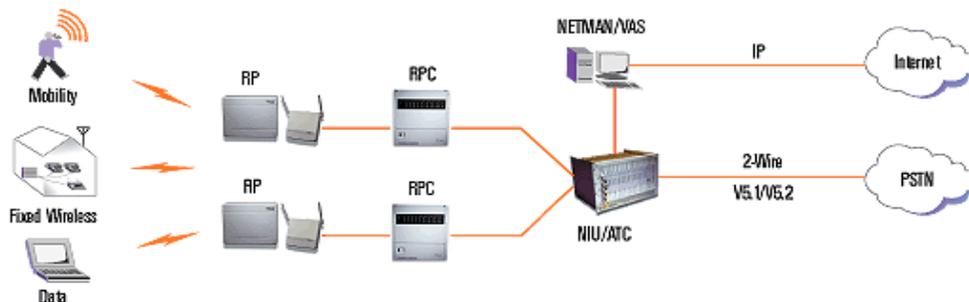
## 5.2 What is PHS?

PHS is a wireless access technology that is capable of providing low speed wireless voice service based on the existing local telephone network. The PHS system originated in Japan as an alternative to GSM and other second generation cellular technologies. When PHS was introduced in China, it was modified to work as an add-on network to the public telephone system. China's PHS system does not have its own switching node. Instead, the base station is connected to the local exchange directly through the V.5 or Signal 7 interface. As a result, service providers can turn unused switching capacity into revenue-generating wireless services. With PHS, service providers can quickly and cost-effectively build out the wireless access network to offer value-added services that are not possible with the traditional wireline network. Figure 5-1 depicts a typical design of a PHS network.

---

<sup>45</sup> According to the GSM Association, the operator-led trade association for the global mobile industry, Taiwan's GSM penetration was 113 percent as of 2004 (GSM Association, 2004).

<sup>46</sup> See [http://www.mii.gov.cn/art/2006/01/24/art\\_166\\_6947.html](http://www.mii.gov.cn/art/2006/01/24/art_166_6947.html).



source: UTStarcom, Retrieved from  
[http://www.utstar.com/Solutions/Wireless/PHS\\_PAS/](http://www.utstar.com/Solutions/Wireless/PHS_PAS/)

Figure 5-1: An Example of PHS Network Design

Compared to other second generation wireless technologies, PHS has several advantages. Since it does not require switching nodes, PHS is simple and cheap to deploy. According to UTStarcom, the leading PHS equipment supplier in China, the payback period for operators generally ranged from 2 to 4 years (UTStarcom, 2003). It is reported that Wenzhou Telecom, a branch of China Telecom in Wenzhou city, recovered its investment in network equipment in less than 1 year (Nin, 2002). PHS can also provide up to 128kb/s data transmission speed which enables the carrier to offer various value-added services, such as text messaging, email, location-based services, mobile Internet access, instant information, etc. However, since PHS rides on a micro cell, its base station can only reach approximately one tenth of the coverage radius of other second generation cellular technologies. Thus, if deployed in large areas, PHS needs a large number of base stations. Consequently, subscribers might experience low voice quality and frequent cut-off if the network is not properly optimized.

### **5.3 The Mystery of the Rise and Fall of PHS in China**

Despite its rapid growth, the development of PHS in China has not been without controversies. The case of PHS reflects tensions between provincial and national interests, ineffectiveness of regulation, and the failure of the regulator to respond to the market in due course. Grass-roots competition appears to overwhelm the government's managed competition. In addition, the traditional "silo model" of regulation is dysfunctional in regulating PHS, that looks like a wireless service but rides on the wireline network.

#### **5.3.1 Slow Progress at the Beginning**

In the late 1990s, the then-dominant operator, China Telecom, was busy expanding its network to meet the huge demand for telecommunications service. At that time, there was hardly any substantial pressure from its only competitor, China Unicom. It seemed that there was no immediate imperative for China Telecom to introduce a new wireless service to compete with its own GSM. However, the divestiture of the mobile service department was an open secret within the industry. Some entrepreneur-minded officials of local China Telecom branches began to look for alternatives to make up the potential revenue loss. Fuxin Xu, head of Yuhang Telecom Bureau, later called the "father of PHS", was one of those few people who were aware of the negative consequences of the possible divestiture. As he told the press later in an interview, he realized that it was very important to find a new revenue source for his bureau (Cao,

2003). It is quite interesting that Fuxin was also the head of Zhejiang Mobile Branch Bureau<sup>47</sup> at the same time.

The tensions among China Telecom's different branches also played a role in pushing the debut of PHS. Although China Telecom's managerial and incentive systems differed from branch to branch at the local level, generally speaking, each department was allowed to keep some of its profit to be distributed as bonus to its staff. Thus, the tension between the more-profitable wireless department and the less-profitable wireline department gave the wireline department some incentive to find additional profit.

In addition, some analysts argue that lack of a local loop is another important reason for China Telecom to introduce the PHS service<sup>48</sup>.

In 1998, Yuhang Telecom Bureau rolled out China's first PHS service. Over 5 thousand subscribers signed up during the first 3 months. The number of PHS subscribers quickly caught up with that of the GSM service in Yuhang.

Yuhang's PHS service gained little attention nationally. Many regarded its PHS as only an experimental network. There was no objection either. There was practically no competition because GSM service, its potential competitor, also belonged to the same company. There was no official response from the regulator regarding the PHS service during this period. However, technically speaking, an administrative order from the former National Radio Administration Commission (NRAC) classified PHS as a wireless access service. In Decree 22 (1996), NRAC assigned 20 MHz (1900MHz to 1920MHz) of

---

<sup>47</sup> Zhejiang Mobile Branch Bureau was part of Zhejiang Telecom Bureau in 1996.

<sup>48</sup> According to personal communication with Ken Zita of Network Dynamics Associates, LLC, New York

spectrum to wireless access services including PHS. In the Decree, NRAC explicitly stated that PHS was not a cellular service, but one of the wireless access technologies.

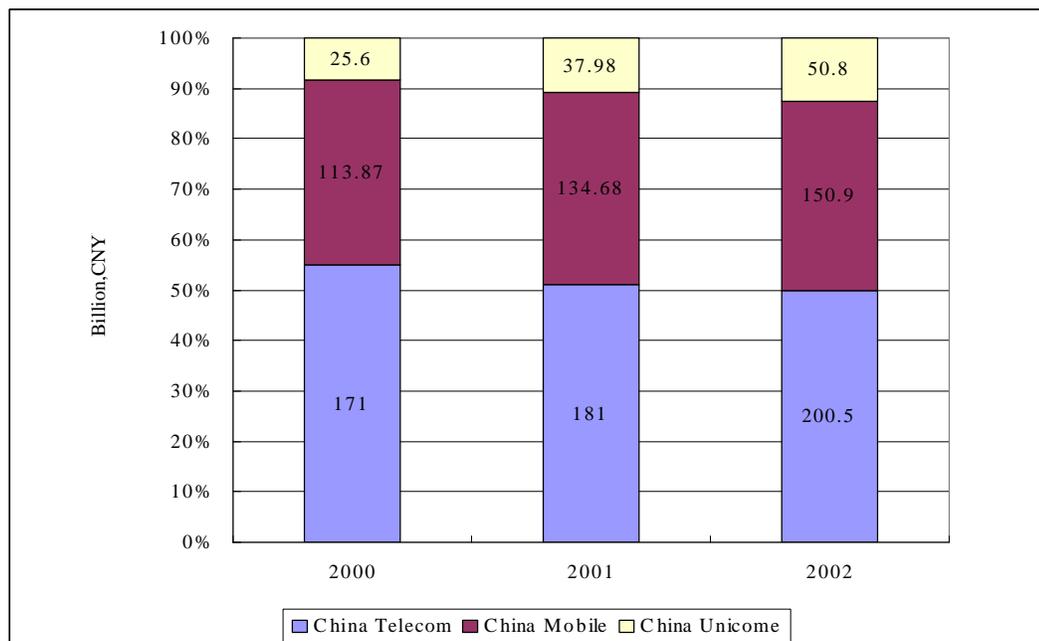
The success of Yuhang's PHS service suggested that there was a huge demand for cheap wireless service that China Telecom's high-priced GSM could not meet. The PHS service was priced as low as one-third of the regular cellular service. In addition, PHS users did not need to pay for incoming calls. Low price has been one of the most attractive features of PHS since its introduction. However, market demand itself was not strong enough to motivate China Telecom to expand the PHS service nationally. This can be partly attributed to the lack of meaningful competition. In addition, since the cellular service was still a part of China Telecom, the integrated enterprise had little incentive to allow competition within itself. As a matter of fact, the development of PHS was very slow after initial debut in Yuhang. However, the emergence of PHS did reveal that tensions among different departments of China Telecom had begun to influence the market structure. The threat of divestiture and possible loss of revenue motivated entrepreneur-minded local telecommunications operators to actively seek new growth opportunities, although those local initiatives were rather sporadic and not necessarily echoed by the parent company. More importantly, the debut of the PHS service signifies the beginning of meaningful competition in telecommunications. PHS was not "planned" in the Chinese government's "managed competition". However, given its limited scale, the PHS service had limited impact nationally at this stage.

### 5.3.2 Rapid but Risky Development from 2000 to 2002

The intense competition from wireless service pushed the rapid development of PHS during this period. After China Mobile was divested in late 1999, China Telecom's growth rate dropped to single digit for the first time since 1990s. The cellular operators were growing at a much faster rate than their wireline counterpart. As presented in Figure 5-2, in terms of operating revenue, the market share of China Telecom had dropped to less than 50 percent in 2002. The new China Telecom inherited not only the less-profitable legacy network and universal service obligation, but also the social burden of the old monopoly. For example, as of 2002, China Telecom had 340 thousand employees and 120 thousand retirees. Similarly, China Netcom had 180 thousand employees and 95.7 thousand retirees. By comparison, China Mobile had only 102 thousand employees and a small number of retirees<sup>49</sup> (Communications Industry Newspaper, 2003). In 2001, the average revenue per employee of China Telecom was 518 thousand CNY, one-third of that of China Mobile (Ministry of Information Industry, 2002). In addition, the substitution effect of wireless service on traditional wireline service became evident during this period. As depicted by Figure 5-3, the number of wireless subscribers was quickly approaching the number of wireline subscriber during this period.

---

<sup>49</sup> The specific number was not released in this report. However, it was reported that all the retirees remained in the new China Telecom after divestiture (Y. Li, Lei, & Xu, 2001).



\*In 2002, China Telecom was divided into China Telecom and China Netcom, 200.5 billion CNY reflects the total revenue of the new China Telecom and China Netcom

Figure 5-2: Operating Revenue of Major Chinese Telecommunications Carriers (2000-2002) Source: MII Statistical Report 2001, 2002, 2003

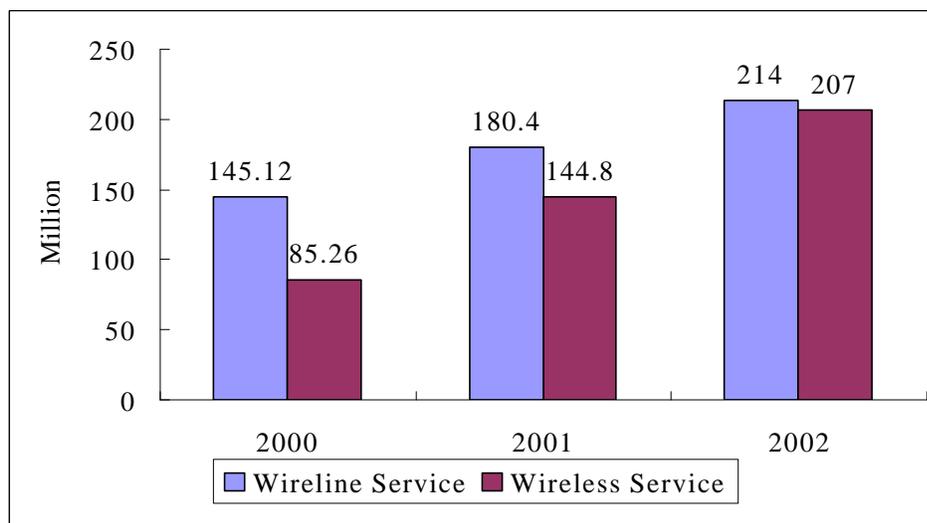


Figure 5-3: The Number of Wireless and Wireline Subscribers (2000-2002) Source: MII Statistical Report 2001, 2002, 2003

It was vital for China Telecom to find new revenue sources. The success of Yuhang Telecom's PHS encouraged other local branches to follow suit. PHS also gained public support. During this period, the PHS service became the hottest topic in all kinds of media nationwide. In some cities, local governments, even the local People's Congress, pushed local China Telecom branches to offer the PHS service as quickly as possible in order to meet the requests of their residents. As a result, China Telecom, especially local China Telecom branches, started aggressively building up the PHS networks. Over 400 local China Telecom branches across the country applied for a PHS license, many of which began to construct networks even without prior approval. By the end of 2002, PHS had signed up over 10 million subscribers nationwide in only two years.

China Mobile united with its competitor, China Unicom, to block the PHS service shortly after it left China Telecom. China Mobile and China Unicom aggressively introduced a low-priced service to attract low-end consumers<sup>50</sup>. They also lobbied intensely to persuade the government to prohibit PHS. They argued that the PHS technology was obsolete and it had already been proved to be a failure in Japan. They also argued that, if PHS was allowed, it should be regulated as a cellular service instead of a wireline service. Thus, the PHS service should follow the same tariff of GSM and CDMA. On the contrary, China Telecom argued that PHS was still a profitable and technologically feasible technology. The PHS was a necessary supplement to the existing cellular market for those customers who only needed low mobility and no roaming. China

---

<sup>50</sup> Low-priced service was introduced at provincial level. The low-priced plan generally offered heavily discounted service charges with no national roaming capability.

Telecom also insisted that the PHS was an extension of the fixed telephone network and should not be regulated as cellular service.

The regulator's attitude was unclear and uncertain. The MII was in a very difficult position. Since all the telecommunications operators are state-owned, they are under direct supervision of the SASAC. As discussed before, one of the primary tasks of the SASAC is to "supervise the preservation and increment of the value of state-owned assets for enterprises under its supervision". Under the scrutiny of the SASAC, the MII could not bear the risk of letting any of those operators lose "value" because of its regulation. In addition, as an essential service for the national economy and security, the tariff for basic telecommunications service, including wireline and wireless voice telephony, is set and monitored by the NDRC. Facing fierce competition from the PHS, many local China Mobile branches cut the prices of their regular cellular service even lower than the PHS service. The NDRC regarded this kind of "price war" as a serious distortion of the market. In 2003, for the first time, the NDRC, along with the MII, issued an order requiring telecommunications operators to file their proposed price changes to both the MII and the NDRC for prior approval.

It was not easy for the MII to find a way to please everybody on the stage. As a result, the MII announced several contradictory orders in about four months regarding the PHS. The final conclusion of the MII was that PHS was a legitimate local telephone service but should be limited to middle and small cities. The MII's conclusion seemed contradictory. The reasoning of the MII was that the PHS technology was not suitable for extensive deployment in big metropolitan areas. However, interestingly enough, the MII did not define "big" and "small" which left great flexibility to operators. By opening

most of the country to the PHS service and keeping the most profitable cities within cellular operators' exclusive control, the MII wanted to find a balance among wireline and wireless operators. Essentially, the MII wanted to stabilize the over-heated competition.

Unfortunately, the MII's effort was not effective at the local and provincial levels. Since the management of China's telecommunications carriers was highly decentralized, there were not many restrictions on the provincial and local branches' business decisions, including investment, marketing, etc<sup>51</sup>. Moreover, since PHS was classified as an add-on service of the local telephone network, local China Telecom branches were able to keep most of their profits from the PHS. In addition, since PHS did not require large investments, most local China Telecom branches managed to finance the PHS project through their own funding and bank loans. All the aforementioned factors gave local branches strong incentives and great flexibility to promote the PHS service. It is interesting that China Telecom headquarters was reported to be very cautious and kept denying that there was a national plan for PHS. As a matter of fact, technically speaking, it might be strategically unfavorable for China Telecom to operate and maintain hundreds of fragmented PHS networks because the PHS technology had a difficulty in future upgrading. That being said, China Telecom headquarters itself might not want to put a huge investment into the PHS in view of getting the cellular license in the near future. However, in reality, although Beijing, Shanghai and Guangzhou, the three most

---

<sup>51</sup> It is not surprising to find that, although under the same brand of China Telecom, local branches usually use their own modified local-flavored brand names when promoting their services. For instance, when promoting PHS service Beijing, China Telecom Beijing Branch usually uses Beijing Telecom instead of China Telecom. US operators often have a unified brand name across the whole country. In China, the brand name such as China Telecom, China Mobile, China Netcom, etc. is more symbolic.

profitable markets in China, were kept out of PHS's reach because of the pressure from the regulator, hundreds of local PHS networks were built up ("Netcom Cancels PHS Plan in Beijing", 2002).

### **5.3.3 No encouragement, No intervention**

In May 2002, the Chinese government further divided China Telecom geographically into two companies, China Netcom (north China) and China Telecom (south China). The direct consequence of the restructuring is that China Mobile overtook China Telecom as the largest carrier in both the number of subscribers and operating revenue. At the end of 2003, the number of cellular subscribers reached 270 million while the number of wireline subscribers was left behind at 263 million (for the detailed subscribers distribution, see Figure 5-4). In terms of revenue, wireless service also exceeded both local and long distance services (see Figure 5-5).

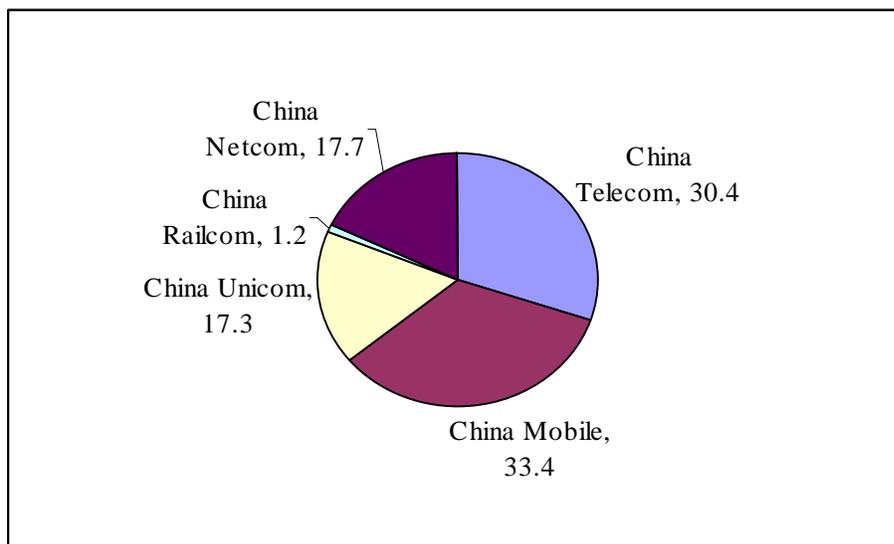


Figure 5-4: Market Share of Major Chinese Carriers, by the Number of Subscribers (in Percentage), 2003. Source: MII (Ministry of Information Industry, 2004)

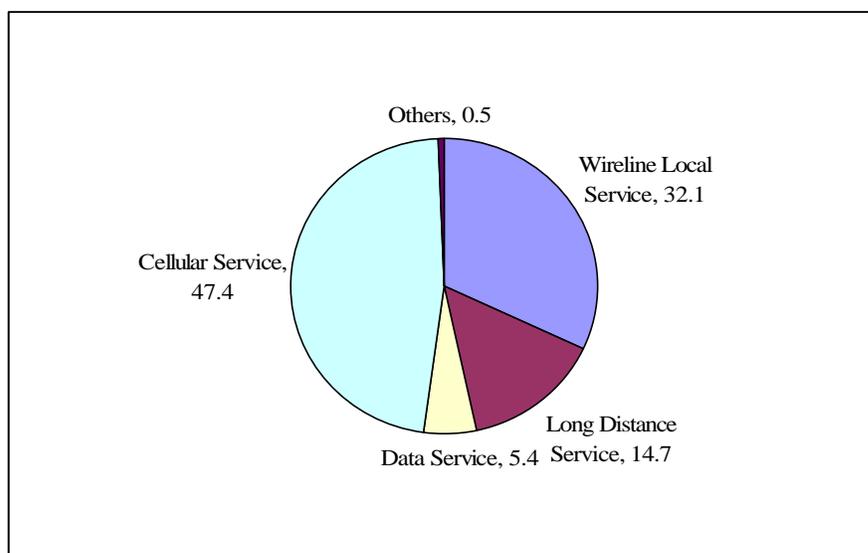


Figure 5-5: Telecommunications Revenue, by the type of service (in percentage), 2003. Source: MII (Ministry of Information Industry, 2004)

Frustrated by the loss of market share and revenue, China Telecom and China Netcom began to aggressively promote PHS service nationwide. Both China Telecom and China Netcom have made great efforts to upgrade and optimize their existing PHS networks. More importantly, China Netcom and China Telecom began to rollout their PHS systems in Beijing and Shanghai, which were still officially banned according to the MII's regulation ("BCC: PHS Business to Be Launched in Beijing on May 17", 2003; "Shanghai Telecom to Develop New Users of PHS", 2004). The headquarters' attitude towards PHS also became clear and consistent. Both China Netcom and China Telecom started to explicitly lobby for regulatory support. New services were developed on the PHS platform. Location service, short message, Internet access and many other value-added services are now available to PHS subscribers. China Telecom and China Netcom interconnected the Short Message Service over the PHS platform in 2004, only 2 years after the 2002 divestiture. Similar interconnection arrangements had taken China Mobile and China Unicom, the two primary cellular operators, over 5 years to reach. It appears that both China Telecom and China Netcom were sending positive signals to their local branches encouraging them to build up networks and attract as many subscribers as possible. The latest data showed that, by the end of January 2006, the number of PHS subscribers had reached 82 million nationwide.

Realizing that it was very difficult, if not impossible, to restrict the PHS service, the MII took some positive steps to help stabilize the market. On March 11 2003, the Minister of the MII, Jichuan Wu, told press that the policy regarding PHS could be summarized as "no encouragement, no intervention."(A. Li, 2003). He emphasized that it was "the operator's, not the government's, business to decide what to do". Later, the Vice

Minister of the MII, Guohua Xi, admitted that the PHS was a historical product of telecommunications reform, in which wireline operators had sacrificed significantly and not yet been compensated fairly. Xi told the reporter that, although PHS should not be encouraged from the regulator's perspective, he thought that China Telecom and China Netcom's promotion of the PHS service was understandable (Nin, 2004). From January 2004, the MII began to include PHS in its monthly report. In addition, although the MII cleaned up and reserved the spectrum ranging from 1880Mhz to 2170Mhz for the 3G service, the MII explicitly stated that PHS could continue to use the spectrum spanning 1900Mhz to 1920Mhz. The MII also allocated additional spectrum, from 1785Mhz to 1805MHz, for SCDMA, a homegrown wireless access technology. In order to cool down the fierce price war, the MII and NDRC ordered PHS to be priced between the regular local phone service and the cellular service. Considerable evidence has shown that the regulator has accepted PHS service as a legitimate basic telecommunication service.

### **5.3.4 Prospects**

The PHS service has become an important revenue source for wireline carriers. Figure 5-6 illustrates that more than half of new subscribers of wireline service are PHS users. While the policy regarding PHS is clear now, it is likely that both China Telecom and China Netcom will continue to build PHS networks. China Telecom and China Netcom are allowed to enter each other's territory to provide telephone service. Without a cellular license, the fastest and probably the most cost-efficient way to start a phone service is to build a wireless access network based on the incumbent's existing local

exchange infrastructure. In summer 2004, China Netcom rolled out its first experimental PHS<sup>52</sup> system in Chengdu city where China Telecom was the incumbent operator. China Railcom was also reported to have ordered PHS equipment from the manufacturer ("China Railcom orders PAS system from UTStarcom", 2003).

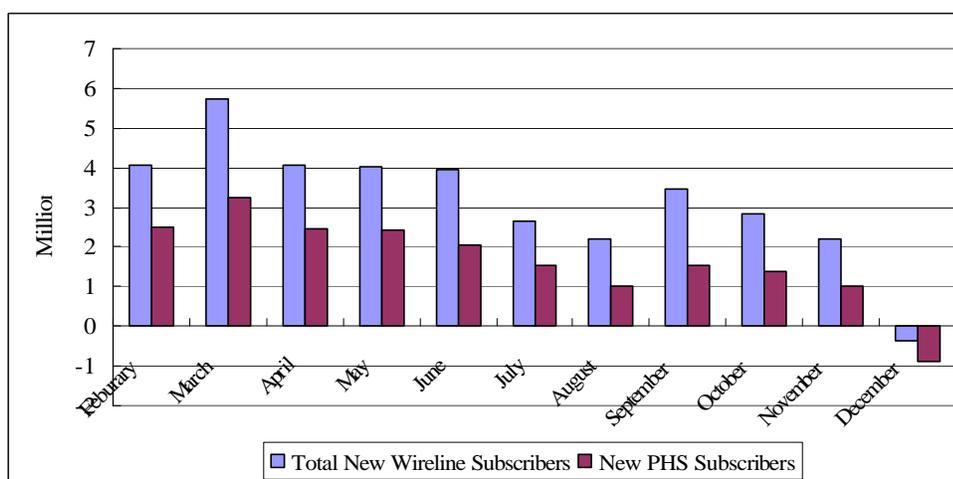


Figure 5-6: New Subscribers of Wireline Service (2005)

With a view to getting 3G licenses in the near future, the growth of PHS will gradually slow down. However, the user base will continue growing for several years. The number of PHS subscribers is expected to reach 90.41 million by 2007 ("China Telecom and China Netcom to Scramble for 3G Market", 2005). It is reported that China Telecom and China Netcom are expected to invest CNY10.4 billion, CNY3.7 billion, CNY1.9 billion, and CNY800 million each year during 2004-2008 in the PHS network ("China Telecom and China Netcom to Scramble for 3G Market", 2005). It is expected that PHS can be used to offer differentiated services to customers. As stated by Beijing

<sup>52</sup> China Netcom's first wireless access network uses SCDMA technology, instead of PHS. However, in order to simplify the discussion, we do not distinguish between SCDMA and PHS. In China, PHS is called "Little Smart". Interestingly, China Netcom's new SCDMA service is called "Big Smart".

Communication Corporation (BCC), a subsidiary of China Netcom, China's wireline carriers will not stop offering PHS even after they win 3G licenses ("BCC: PHS Business to Be Launched in Beijing on May 17", 2003).

#### **5.4 Lessons Learned**

The PHS service has successfully grabbed a large portion of low-end consumers. Some people carry two phones, a PHS phone for local calls and a GSM or CDMA handset for national roaming. A study found that 36% of subscribers of China Mobile also had a competing PHS phone account (Buckman, 2004). While the growth of both regular local and cellular service gradually slows down, the PHS service is becoming the focal spot of China's telecommunications industry. The PHS service has brought meaningful competition into the cellular market. The pressure from PHS has driven cellular operators to cut their prices and improve the quality of service. In many cities, local cellular operators even offer local plans that are priced equally or even lower than PHS. However, confronting changing market conditions, the regulator has been slow in its reaction and the regulation has been dysfunctional in its effect. The regulatory model demonstrated in Figure 4-5 is modified to reflect the case of PHS in Figure 5-7.

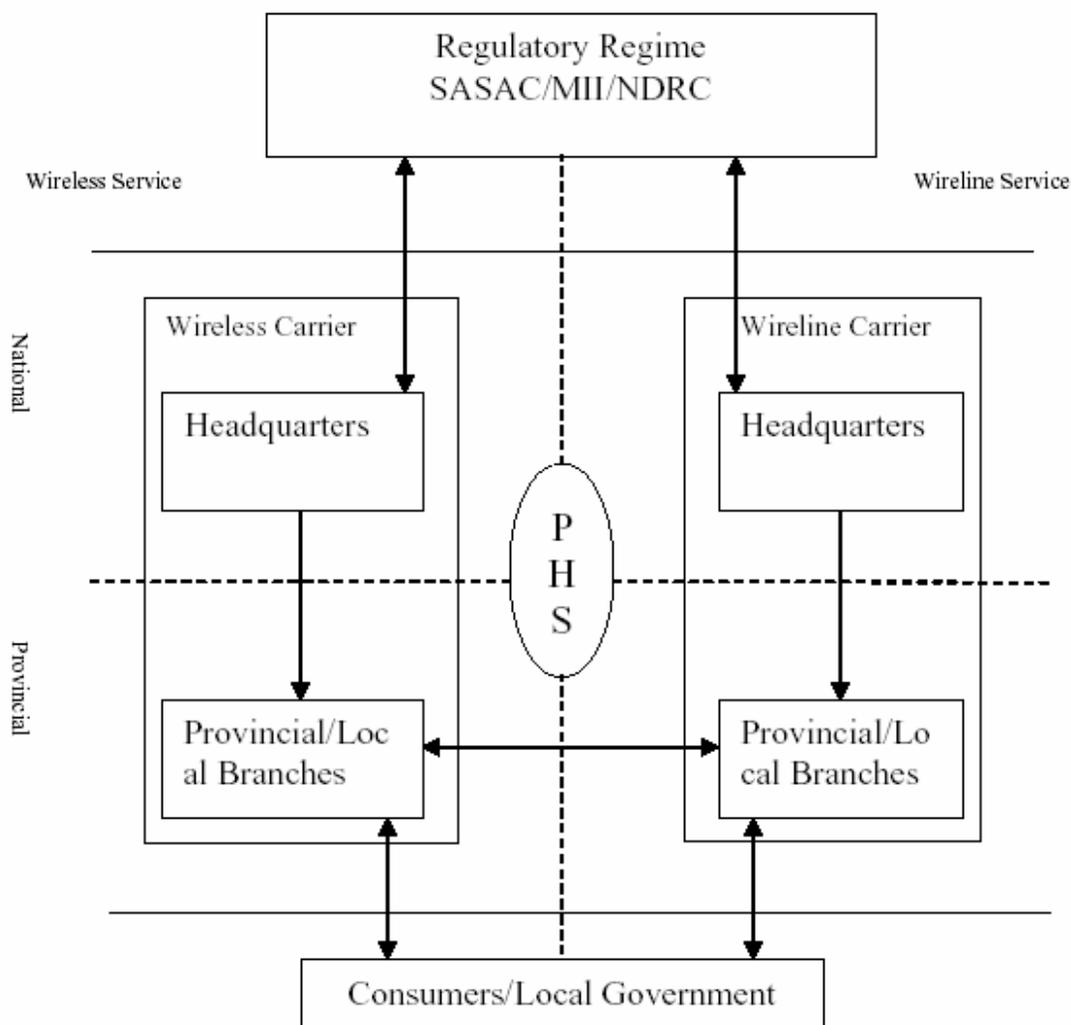


Figure 5-7: Modified Analytical Framework for PHS

#### 5.4.1 Decentralized Structure

The decentralization of both the management structure and regulatory regime is one of the most important factors in understanding the rise and fall of the PHS service. The decentralized management structure of China's telecommunications carriers makes it possible to introduce new services in a bottom-up fashion. Different provincial/local

branches may have their own plans that might even conflict with their parent company's national strategic plans. In the case of the PHS, especially in the first and second stage, the parent company is clearly very passive while local branches are aggressively pushing the service. Competition generally takes place at the provincial/local level while the headquarters lack effective means to oversee its progress. The decentralized regulatory regime often leaves regulations and policy ineffective. The interaction between headquarters and the regulator has limited influence on the market, particularly when the PHS service is categorized as a local service. There is a famous slogan in China: "you (central government) have a policy, I (local government) have countermeasure". In telecommunications, there is a similar saying: "you (regulator/headquarter) prohibit core service, I (provincial/local) can do something peripheral".

#### **5.4.2 Silo Model**

The current regulatory model follows a "silo" approach. Wireless and wireline services are regulated differently. However, it appears to be difficult to position the PHS service in either category. Technologically speaking, PHS is a wireless access technology riding on the wireline network. Thus, the PHS service should be regulated as a wireline service. However, when the PHS service is deployed citywide, it seems to have no difference from other dominant wireless services, such as GSM, CDMA, etc. Should a new service be regulated according to its technological characteristics or its service rendered? The current silo approach has no clear answer to this question. Unclear

definitions lead to uncertainty in regulatory decisions, which have been demonstrated in the short history of the PHS in China.

### **5.4.3 Balance Seeking**

PHS also reflects the dilemma of state ownership. At the regulatory level, under the current political arrangement, all the telecommunications operators are state-owned. Hence, the regulator must coordinate with the state to preserve the value of the state assets. The regulator cannot endure the consequence of possible loss of state assets under its regulation. In that regard, the best the regulator can do is to distribute profits among those state-owned operators. The “balance seeking” approach leads to shaky stands of the regulator that are, in turn, often challenged by the regulated industry and other government agencies.

## **5.5 Concluding Remarks**

In this case, we have used the development of China’s PHS service to demonstrate that China’s telecommunications market is influenced by three players: the government, operators and consumers. The relationship among those three players and their relative strengths is the key to understanding “telecommunications with Chinese characteristics”. The internal conflicts and competitions between and among those three players have shaped the industry significantly.

The PHS service is somewhat incidental. Before PHS, there was hardly any meaningful competition in China's telecommunications market. PHS was the first service that had significant impact on the market. More importantly, the PHS service gained its popularity from the bottom up. Before PHS, the effort of the Chinese government to introduce competition had little effect, if any. In a sense, the PHS service is the first time that China's operators actively attempted to find a way to compete with their rivals without being planned to do so. As a specific technology, the choosing of PHS might be incidental. However, PHS reflects inevitability because true market-based competition can hardly be managed by the government.

## Chapter 6

### IPTV: CONVERGENCE OF CABLE AND TELEPHONE

#### 6.1 Introduction

There is no doubt that IP has changed everything. IP technology allows various broadband applications to work together to enhance the capabilities of otherwise separate services. In the video marketplace, IPTV technology is no longer a future possibility, but a present reality. While cable television companies have been offering broadband service for about a decade, telecommunications carriers are now ambitiously building video-enabled networks and offering equivalents of traditional broadcast and cable video service. However, IP-enabled services such as VoIP and IPTV are not only bringing new opportunities, but also provoking regulatory headaches worldwide. It is clear that existing regulatory and governmental structures need to be reconsidered. Traditional models of regulation have become dysfunctional, doing more harm than good. The inherent paradoxes of these models becomes apparent in the attempt to apply them to IPTV, a technology which can span broadcasting, cable, satellite, mobile and the Internet, delivering packets of bits which can be reconstructed into “television” or something like it.

In China, TV and telecommunications services have been regulated by different government agencies and strictly separated since 1949. This chapter examines the impact

of the old “silo” regulatory model on the development of the IPTV market. It also explores the potential of IPTV to reshape the existing regulatory regime.

## **6.2 What is IPTV?**

“IPTV” generally speaking, refers to video content delivered to a user over a closed network by means of IP-based technology. This content is generally referred to as “television”. The name is a bit misleading because IPTV can carry any kind of video content. It is also worth noting that IPTV can be delivered not only over telephone lines, but also fiber optics, co-axial cables, satellites, broadband wireless, and power lines.

Advantages of IPTV include a two-way capability lacked by traditional TV distribution technologies, which enables the service providers to “triple play”. Triple play is often used by telephone carriers to describe a consumer package including telephony, data and video. In fact, triple play is not a new business concept. Cable carriers have offered voice and data services over their cable TV platform for a long time. The thrust of IPTV is its relatively low deployment cost. Unlike a cable TV network, that was originally designed to be a one-way network and needs a huge investment to be upgraded to offer IP-related services, a broadband network is inherently two-way capable and ready to carry IPTV packets.

IPTV uses less bandwidth. Unlike cable television, which delivers all of its channels concurrently (both analog and digital), IPTV delivers only one channel at a time. Thus, less bandwidth is required. The signal can be received either on a computer with appropriate software, or on a television set equipped with an IPTV set-top box. The

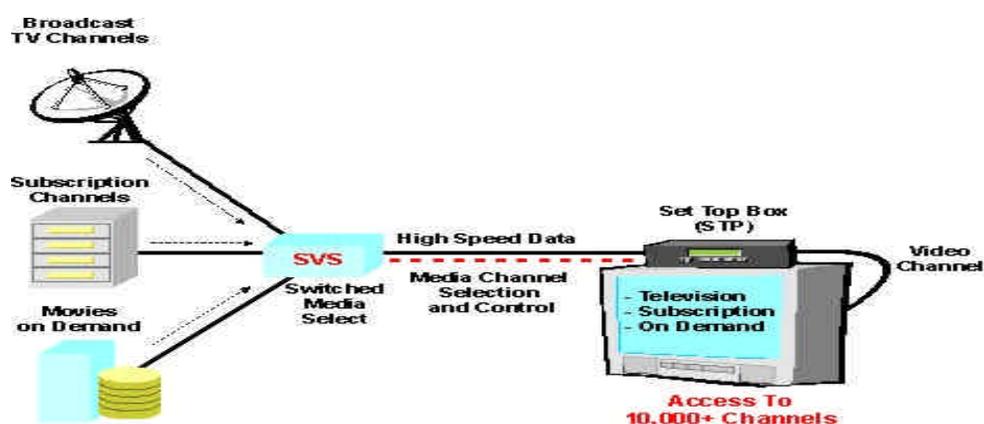
signal can then be recorded and/or transferred to other IP-enabled devices. This feature makes it possible for IPTV service to be priced less than traditional cable TV service.

In addition, IPTV offers more features than traditional cable TV service. Unlike a cable “converter” box, the IPTV “box” is really a fully-featured digital media player or computer. Even so, it may be designed to look like a traditional analog “converter box” in an effort to be consumer friendly. The “box” and software can be packaged with a digital video recorder, with a hard drive, which can provide VCR or TiVo like features – e.g., stop, rewind, re-play, fast forward.

On the other hand, IPTV requires higher network transmission quality. In its initial implementations, IPTV rides on a DSL circuit delivered by a “telephone” company over its existing plant using a copper line into the home. To make this possible, IPTV relies heavily on compression. To work over copper lines, it needs better compression than MPEG-2, which is being provided by Windows Media 9, and MPEG-4. For example, an MPEG-2 picture might require 4Mbps to work. One IPTV system, Bluewin, uses a total connection speed of 2.4 Mbps, 1.8 Mbps of which are dedicated to IPTV, and the rest are available for features, Internet connectivity, or voice (C. Liu & Taylor, 2005).

Strictly speaking, the customer experience with IPTV might be slightly different from that of traditional TV service. When the viewer changes channels, the set-top box notifies a computer server at the IPTV operator’s facilities to virtually instantaneously send a new stream of programming packets. Although this network design enables the service provider to offer virtually unlimited channels, it might also lead to longer “waiting” time during channel switching.

Microsoft is currently the leading provider of IPTV software. However, the IPTV set-top boxes are being manufactured by several electronics hardware companies. Microsoft has entered into an agreement with Alcatel to partner for this purpose. Microsoft apparently wants to offer an end-to-end turn-key package, but at present it is possible for carriers to make an agreement with Microsoft just for the use of the software package. For the purpose of illustration, Figure 6-1 shows a simple IPTV platform.



Source: <http://www.iptvdictionary.com/>

Figure 6-1: IPTV Platform

## 6.3 IPTV in China

### 6.3.1 Market Development

China may be in a position to overtake both Europe and the U.S. in consumer entertainment by adopting IPTV. China's telecommunications operators and broadcasters are gearing up to tap into IPTV, a potentially lucrative business. China now has about 100 million cable TV subscribers and nearly 23 million broadband Internet users.

Nationally, the State Administration for Radio, Film and Television (SARFT) says there were 2.19 million IPTV subscribers in 2004, up from approximately 10,000 in 2000. Du Baiochuan, a SARFT official, is quoted as saying he expects IPTV subscribers to reach 20 million in 2008. Other forecasts vary. Analysis International, a leading technology advisor in the Asia-Pacific Region, projects that the number will reach 16.65 million by 2007 ("Number of China's IPTV subscribers expected to reach 1.17mn", 2005). IDC forecasts the number of IPTV subscribers will exceed 8 million in 2008. Informa Telecoms and Media, a globally well-known market research company, predicts that the number will reach 4.9 million by 2010, where the U.S. will take second place with 3.9 million subscribers ("China to Be World's Largest IPTV Subscriber Market by 2010", 2005). On the downside, Norson Telecom Consulting predicts only 1.2 million subscribers by 2009, citing regulatory obstacles. IPTV services in China are expected to be a US\$12.5 billion market by 2008.

#### **6.3.1.1 The IPTV “Gold Rush”: 2004**

Due to ambiguous government policy, both telecommunications operators and other non-TV media companies rushed into the IPTV market in 2004. China Netcom, the country's fourth largest telecoms carrier, edged into the Internet protocol television sector by establishing three IPTV websites over the past half-year. The latest TV station of this kind is [www.bjiptv.com.cn/](http://www.bjiptv.com.cn/), co-launched by Beijing People's Broadcasting Corporation (BPBC) on December 24, 2003. The BPBC's TV website started trial operations on December 24th simultaneously in Beijing, Tianjin, Hebei Province and Heilongjiang

Province. In addition, Netcom has joined hands with the International Data Group and China Central Television to enter the Internet TV business. Netcom poured RMB 500 million into a broadband Internet venture, Tiantian Online (<http://www.116.com.cn>). Netcom is the largest shareholder in the venture with a 40% stake. China Netcom is also a strategic partner of [www.chinasee.net](http://www.chinasee.net), an Internet TV site opened by the dominant state TV agency CCTV this June. Now chinasee.net operates in Beijing, Shanghai and Jiangsu Province, with 22,000 paid users registered. CCTV has said it expects to recruit 600,000 IPTV subscribers this year. China Telecom was said to have plans to launch large-scale promotions of IPTV in most cities in the country this year, following the launch of the Internet TV service in Shanghai last August, also in co-operation with a subsidiary of China's Central Television (CCTV).

Many entities other than telecommunications carriers also have an interest in IPTV. Wang Liang, head of BPBC, reportedly said: "there is a huge potential for IPTV. There are limited channels for both television and radio, whereas the space for Internet television is endless. Unlike television stations, we do not need big television cameras: a family-use digital camcorder will work" (Jiang, 2005). He noted that low production costs are vital for a country playing leapfrog with western technologies by going straight from radio to IPTV. It is cheaper to use China's mushrooming number of Internet connections than it is to build cable TV networks (Jiang, 2005).

### 6.3.1.2 The SARFT Reclaiming Control

At the end of 2004, the SARFT issued a new administrative order requiring all IPTV licenses to be reviewed. Only two companies have been reissued licenses after the review: China Central Television (CCTV) and Shanghai Media Group<sup>53</sup> (SMG).

CCTV has a long history of trying to tap into the IPTV market. Early in August 2002, CCTV and China International Television Corporation (CITVC) invested RMB 50 million in setting up ICCTV.com.cn Networks Corporation Ltd. In 2005, CCTV launched its news and entertainment channels on [www.cctv.com](http://www.cctv.com), a step farther into the IPTV industry ("CCTV Bets Big on IPTV Business", 2005).

SMG, based in Shanghai, is one of the largest media companies in China. SMG has teamed with China Netcom and China Telecom to offer IPTV trial service. China Telecom will initiate the service in 17 pilot cities including Shanghai, Guangdong, Zhejiang, Jiangsu and Shaanxi. China Netcom will introduce the business in Harbin, the capital city of Heilongjiang Province. ("18 Chinese Cities to Test Run IPTV Business", 2005). SMG also launched an IPTV research laboratory with Alcatel Shanghai Bell Co., Ltd. in Shanghai aiming to provide IPTV solutions, and boost the commercialization of IPTV services in China on July 13, 2005. ("Alcatel Shanghai Bell, SMG Launched IPTV Lab", 2005).

---

<sup>53</sup> SMG's consists of 11 analog TV channels, 90 digital paid cable TV channels, along with 10 analog and 19 digital radio services. The group also operates and owns 5 sports centers and 14 cultural art centers. Other areas of operation include newspapers, magazines, news websites and audio-visual publishing. The group has around 5,200 staff, with capital assets totaling RMB 11.7 billion.

The private sector, especially Internet content providers, has also shown an interest in the IPTV market. Interactive Entertainment Ltd., China's largest online gaming operator, recently signed a cooperative agreement with 48 leading content service providers to form China's first IPTV content alliance ("Shanda Set up First IPTV Content Alliance", 2005). Chinese web-portals, such as sina.com, sohu.com, tcom.com, etc., were frequently reported to be entering the IPTV market, although many of those reports turned out to be bogus. However, it is unlikely that the SARFT will open the television industry, including IPTV, to private and foreign content providers in the near future.

### **6.3.2 China's IPTV Regulations**

#### **6.3.2.1 Regulation of China's Cable Industry: An Historical Review**

Since 1949, cable networks and telecommunications networks have been regulated by different government agencies. Overall speaking, Guo, a professor of the Beijing Broadcasting Institute, argues that the SARFT still manages the cable industry in the old demand-economy style, although in the name of law and regulations (Guo, 2003).

Compared to telecommunications, the structure of China's cable industry is even more decentralized. The earliest cable systems in China were the so-called ICT (Industrial Community Television) or "factory zone TV" within a factory zone, which was the unit of local community during the period of planned economy (Shoemith & Wang, 2002, p.192). On January 17, 1991, the State Council issued a document that stated: "cable television is an important part of China's television industry, and as an

extension, supplement, and development of broadcasting television, cable television should be treated equally as broadcasting television” (Hong, 1998, p.116). This statement stimulated the local governments and the state-owned factories to invest in building cable systems. Those cable networks were primarily used to relay broadcasting signals. Those local-government owned networks were regulated by the local SARFT branches. The local SARFT also started to build its own citywide cable network. However, no companies outside of the SARFT’s system were allowed to invest in the Chinese cable infrastructure, and no cable operators could own cable systems outside of their regions (Goro & Sylvia, 2005). With an eye to expediting the development of digital TV, the SARFT has begun to encourage conglomeration and cross-entry of cable operators. However, the pace of the restructuring is far from satisfactory. The SARFT's trunk network has difficulty expanding into cities and towns because they all have their own cable networks ("SARFT Intends to Control China's CATV Networks", 2005). Now, China still has some 1200 cable operators (Goro & Sylvia, 2005). In the past, China’s cable business was not treated as a separate industry; rather, cable operators had been integrated into terrestrial broadcast stations of the same region and worked closely with their broadcast counterparts in programming (Guo, 2003). In 1999, the SARFT adopted a new policy called “separation of network and station”. According to that the policy, cable operators should only transmit signals, while stations should be regarded solely as content providers.

### 6.3.2.2 IPTV Regulation

With the advance of new digital technologies, both cable networks and telecommunications networks are able to provide high-speed broadband services. Both networks and their regulators are trying to maintain monopoly power over their traditional service domains and, but at the same time, penetrate into each other's turf. However, in 1999, the State Council's Decree 75 reiterated the national ban on network convergence. Since then, no license has been issued to television/cable/radio companies to offer telecommunication services by the MII, and the SARFT has also strictly prohibited telecommunication carriers from entering the television market. Figure 6-2 depicts the current regulatory model of IPTV.

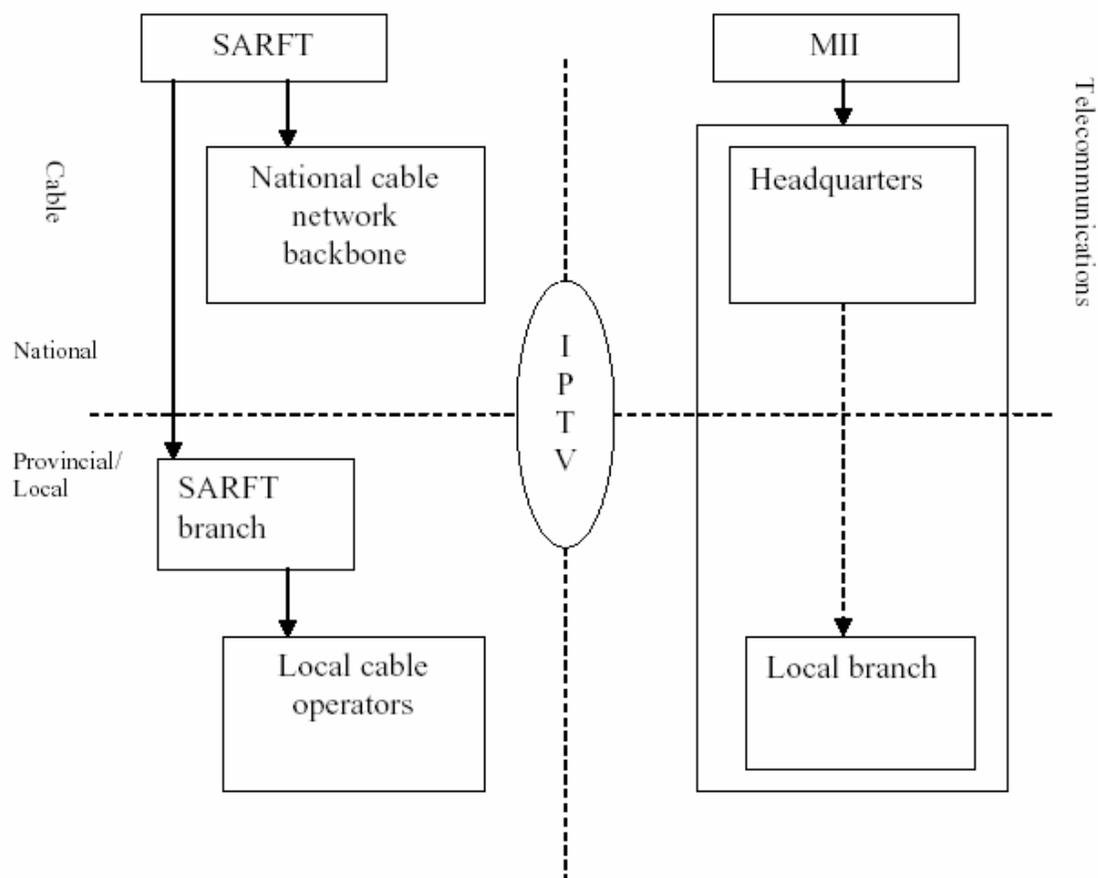


Figure 6-2: Framework of IPTV Regulation

IPTV seems to have made some breakthroughs in the obsolete national ban. In 2003, the SARFT issued “The Management Measures for Dissemination of Audio-Visual Programs on Internet” (Decree 15, 2003) that established a licensing regime for audio and video content transmitted over the Internet. Subsequently, by the end of 2004, over 80 organizations obtained a 2-year permit to transmit audio-visual programs over the Internet.

While the industry was rushing into the promising IPTV market, the SARFT revised Decree 15, reclaiming rigorous control over IPTV. According to the new order<sup>54</sup>, IPTV can be delivered to the TV set, but only television stations and other media companies regulated by the SARFT are eligible. Telecommunications operators are allowed to relay audio-visual content over their networks, but can not integrate content with conduit. Companies with foreign capital are prohibited from providing IPTV service. As a matter of fact, all the IPTV licenses issued in 2003 would have expired in 2005. It is reported that the SARFT had taken actions to close down illegal IPTV services ("SARFT Takes Actions on Illegal IPTV Vendors", 2005). So far, only two companies have been issued new IPTV licenses: China Central Television (CCTV) and Shanghai Media Group (SMG).

However, the decentralized structure of China's cable industry brings uncertainty to the market. Similar to telecommunications, regulations on cable are often ineffective at the local level. Liu (1994) argues that the commercial imperatives that had driven cable developments at the local and provincial levels were in direct conflict with the political objectives of the central government. Cable operators have incentives to cooperate with telecommunication carriers to utilize their networks to provide telecommunication services, such as VOIP, broadband access, etc<sup>55</sup>. For telecommunication carriers, setting up joint-ventures with those companies that have been issued IPTV licenses is also probably the most feasible way to circumvent regulatory barriers. As an example,

---

<sup>54</sup> Decree 39. 2005

<sup>55</sup> Some local cable operators have started to provide high-speed Internet access service. For example, Hefei city cable, Guangdong provincial cable, etc.

interestingly enough, when Beijing Radio Station announced its debut of Beijing Network Television (Beijing Wang Shi), one reporter wrote “when you look behind, you will see full of Beijing Netcom’s staffs” (P. Liu, 2005)

## **6.4 Issues and Prospects**

### **6.4.1 IPTV vs. Digital TV**

The SARFT has a schedule to finish upgrading China’s analog broadcast television network to digital by 2015. According to the SARFT’s plan, digital TV programs should be available in all 4 municipalities and over 60% of provincial capitals by the end of 2004 (“China Accelerates Popularizing Digital TV Sets”, 2004). However, on the user-end, a recent report from Analysis International, a consulting company in the Asia- Pacific Rim, said that the number of Chinese digital TV subscribers would be merely 5.35 million by the end of 2005, much less than the number that the SARFT had expected (“Digital TV Meets Cold Reception in China”, 2005). A lot of problems are hindering the development of digital TV. High price is one big obstacle for the general public. The monthly subscription fee for digital TV is usually three times that for analog cable television service, not to mention the initial 1000RMB (US\$120) set-top box.

The fragmented management structure of China’s cable TV system is another problem. Every province, if not every township, has its own cable operator. Unlike telecommunications, China’s cable TV network is not nationally integrated. Thus, the SARFT has no direct control over thousands of small network operators. Evidence shows

that the fragmentation has slowed down the SARFT's plan of transition. China Development Bank (CDB), which has an agreement with the SARFT to finance the digital TV transition project, told the press that it had tremendous difficulty evaluating applications for loans from numerous operators. CDB urged the SARFT to make a coherent national plan as soon as possible ("CDB Falls Into Trouble in Making Loans to Cable TV Industry", 2005).

Ambiguous policy regarding digital TV standards also slows down development<sup>56</sup>. There is a strong group of policy makers who believe China should secure technological independence from the West in key industries, such as 3G (the Third Generation Wireless), digital TV, etc. However, this goal is not easy to accomplish. China has postponed the release of its digital TV standards repeatedly since 2003. Though nobody expects the Chinese government to abandon its domestic digital TV proposal, the operators can not wait, but have to turn to overseas vendors to meet the deadline for the digital transition (Andrew, 2004). Even within the government, there seems to be some discrepancies among ministries. Liu Quan'en, who led the government's standards process for digital TV, said in later 2004 that the MII was backing the domestic standard, while the SARFT wanted to use mature international standards in order to roll out digital TV service as soon as possible (Andrew, 2004). The most recent report disclosed that the final digital TV ground transmission standards would be submitted to the National

---

<sup>56</sup> By the end of 2004, European's DVB-T had gained 9 contracts in China, while the domestic Tsinghua University's DMB-T had signed 7. Shanghai also began to test trial Shanghai Jiaotong University's ADTB-T standard.

Development and Reform Commission (NDRC) soon, and the decision is expected to be announced in 2005 ("Digital TV Ground Transmission Standard to Debut", 2005).

Nevertheless, the SARFT has taken several initiatives to facilitate the digital TV market. The SARFT recently decided to give out free set-top boxes that would create at least 30 million digital TV users and a digital TV market valued at over RMB 20 billion ("SARFT Delivers Free STB to Create Digital TV Market", 2005). In addition, the SARFT is encouraging operators to build up inter-province networks to help integrate the fragmented market ("CDB Falls Into Trouble in Making Loans to Cable TV Industry", 2005). With an eye to the SARFT's pressing need to popularize its own digital TV system, it is not difficult to understand the SARFT's lack of interest in IPTV that is primarily pushed by telecommunications operators.

Many people believe that the rapid development of IPTV will cannibalize subscribers from digital TV to some extent. However, responses from cable operators are optimistic. Luo Xiaobu, vice general manager in Oriental Cable Network Co.<sup>57</sup>, commented that digital TV would dominate the development trend in the next several years, citing the fact that IPTV was restricted by regulatory factors. In the long term, he expected IPTV and digital TV to be complementary, instead of rival, technologies ("Development of IPTV Not Mature, Oriental Cable Network", 2005). Analyst Junmei He of ABI Research also predicted that the SARFT was likely to include IPTV in their digital TV plan and remove the current regulatory barriers gradually. Concurring with

---

<sup>57</sup> Oriental Cable Network Co. operates the world largest metropolitan cable network in Shanghai, China

Luo Xiaobu, he also predicted that IPTV would not be a competitor of digital TV in the long run ("China IPTV: Another View ", 2005).

#### **6.4.2 Content**

In China, both television stations and cable operators are state-owned and regulated by the SARFT. In a sense, the television industry in China is a closed system. The SARFT controls the entire business chain from production to distribution. China's cable systems now deliver as many as 80 channels. However, many programs are homogeneous. In the near future when digital TV is ready, it will not be easy for the SARFT to fill up hundreds of new channels. As noted by Junmei He of ABI Research, "in the current business model, the IPTV content provider is also the content aggregator, and even the service provider. IPTV content providers are lacking the commercial experience needed to aggregate and package content flexibly and effectively" ("China IPTV: Another View ", 2005).

Regarding television programming, there is no sign that the Chinese government will loosen its rigid control. The SARFT, guided by the Party's propaganda department, censors all foreign-made media content and restricts non-Chinese programs to 30% of each TV channel's broadcast. One concern, expressed by Wang, a senior officer of the SARFT, regarding IPTV is its interconnectivity with the Internet. He commented "although IPTV is a very promising technology, it is not appropriate for telecommunications carriers to get involved. Telecommunications carriers' IPTV network is interconnected with the public Internet. Thus, it is very difficult for us to

control the content being transmitted that brings potential threats to national security and culture integrity” (Shun, 2005).

In addition to regular TV programming, IPTV is capable of offering some new features such as online gaming, distance education, etc. As a matter of fact, it might be a better strategy for telecommunications carriers to focus on those new services rather than to simply replicate its competitor’s regular TV programming. Shanda Interactive Entertainment Ltd., China's largest online gaming operator, has signed a cooperative agreement with 48 leading content providers to form China's first IPTV content alliance ("Shanda Set up First IPTV Content Alliance", 2005). China Telecom and China Netcom also say that they will focus on new features of IPTV. However, some observers worry that, despite these advanced features, without enough regular content, it will still be very difficult to snatch the general public from cheap regular cable television service (Rebecca, 2005).

### **6.4.3 Propaganda**

One, if not the most important, reason for the Chinese government to keep tight control of the TV industry is its crucial importance in propaganda. Fearing ideological influences, the Chinese government is reluctant to open the TV industry, especially to western investors. The Party’s powerful propaganda department fears that the opening up of media-rich sectors, such as TV, radio, newspaper, etc., to foreigners could eventually weaken its established propaganda machine that has been an effective tool of social control for decades. However, the popularity of the Internet, especially with the dramatic

growth of broadband, has made it extremely difficult, if not impossible, for the state to censor all the media content. The latest peer-to-peer technologies, such as BT, Napster, etc., enable broadband users to share not only software, but also media-rich content. How effective the Chinese government's censoring system might ultimately be is questionable.

## 6.5 Concluding Remarks

Historically, cable TV and telecommunications are regulated differently based on the nature of technologies. Cable TV networks were originally designed for transmitting video signals and, by their nature, are a one-way medium. On the contrary, telecommunications networks used to be narrowband, two-way transmissions that were not suitable for video applications. However, with the advancement of technology, both cable and telecommunications networks are now readily available for broadband applications. There is now no clear technological divide between cable TV and telecommunications networks.

Despite obstacles, convergence is inevitable. In China, historically, the government has conflated the content of broadcasting (programs) with the means of its distribution (assigned frequencies in the spectrum). When emerging technologies, such as IPTV, enable telecommunications to penetrate the closed television system by offering alternative ways of distribution, the content regulator is perplexed. As a result, the most natural reaction from the regulator is to make the "walks like a duck" argument. However, just because IPTV can be used to deliver television programs, that doesn't make it a television service. Although the issue of propaganda concern has helped the SARFT to

secure its control over IPTV, there is hardly any consensus among interested parties. The current regulation regarding IPTV is tentative at best. Essentially, regulators worldwide are facing the same dilemma. Just because IPTV can be used to deliver “video” or “content”, it does not make it a “television broadcaster” or a “cable” company.

New regulatory approaches are needed to handle new technologies. One solution is to adopt the layered model, which substitutes for the service-based approach of the current model an approach based on the technical nature of the underlying, multi-purpose networks used to provide those services. Another solution is to separate censorship function from network operations. Nevertheless, irrespective of which alternative is chosen, it is clear that that some kind of major, possibly radical, reform is needed in the regulatory regime to adapt to technologies like IPTV, and that given the global momentum of these technologies, these fundamental decisions need to be taken sooner rather than later to give direction to the market and the public.

## Chapter 7

### 3G: MADE IN CHINA

#### 7.1 Introduction

Standards play an important role in shaping the global telecommunications industry. Once a standard is established, manufacturers and customers benefit from reduced market uncertainty (Funk & Methe, 2001). Firms which are able to win the standards competition gain higher return than firms which support losing technologies (Keil, 2002). After leapfrogging into the world's largest second generation cellular market, China has a new ambition which is to promote its homegrown third generation wireless standard, TD-SCDMA, which has been accepted by the ITU as one of the official 3G standards.

Standards can be set by market or committee (Farrell & Saloner, 1988). In the market-based selection of *de facto* standards, independent firms negotiate the exchange of technology in an attempt to create "bandwagons" to develop products based on their own technology (Farrell & Saloner, 1985). The choice of an open or closed policy plays a major role in the competition between standards because such policy can affect the installed base, which will in turn affect the choice of standards due to network externalities (Grindley, 1995). Committee-based standardization generally operates on a consensus basis. Institutional factors may improve the possibility of consensus resulting in standards being chosen (Sirbu & Zwimpfer, 1985). The extent to which the market and technology are known, the extent that firms are able to form coalitions, and cooperation

among rivals in establishing a coalition may effect the final selection of standards (Hawkins, Mansell, & Skea, 1995). Furthermore, Funk (2001) argues that although the telecommunications industry is rapidly globalizing, governments can still set national telecommunications standards and play a strong role in the setting of global mobile communications standards.

Previous research has revealed that the market-based mechanism does not always succeed in picking the best standards (Farrell & Saloner, 1988). Studies have also found weaknesses in the committee-based standard setting process (David & Shane Greenstein, 1990). Committee-selected standards tend to choose current or known technologies rather than emergent or new ones (Sirbu & Zwimpfer, 1985). Technical experts, instead of final users, have a dominant influence on the standards setting process (David & Shane Greenstein, 1990). Farrell and Saloner (1988) suggested that a hybrid system that uses both the market and committee mechanism might result in better performance.

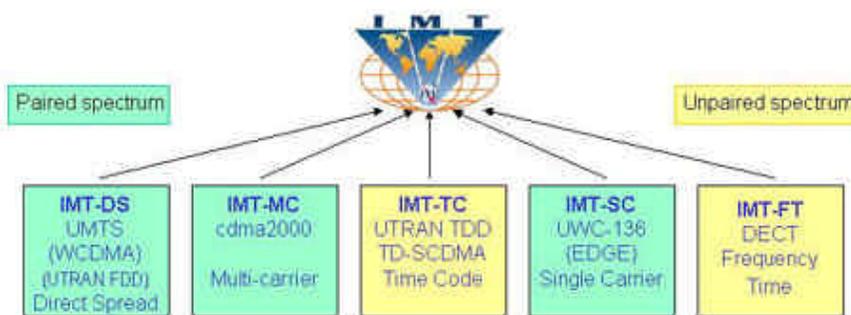
However, it appears that it would be inaccurate to fit China's standards setting into either model. The influence of the Chinese government, which used to set standards directly, is gradually diminishing while the market mechanism has not yet been fully established. The outcome of China's standards setting is often difficult to predict due to the dynamics among manufacturers, the Chinese government, and telecommunications carriers under fast changing economic, political and social environments.

## 7.2 Overview of 3G Standards

3G is a term used to describe next generation mobile services that provide high-speed Internet and multimedia services in addition to better quality voice. The ITU requires that IMT-2000<sup>58</sup> (3G) networks, among other capabilities, deliver improved system capacity and spectrum efficiency over the 2G systems and support data services at minimum transmission rates of 144 kbps in mobile (outdoor) and 2 Mbps in fixed (indoor) environments. Based on these requirements, in 1999, the ITU approved five radio interfaces for IMT-2000 standards as a part of its ITU-R M.1457 Recommendation (See Figure 7-1).

### IMT-2000 Terrestrial Radio Interfaces

\*Source: ITU



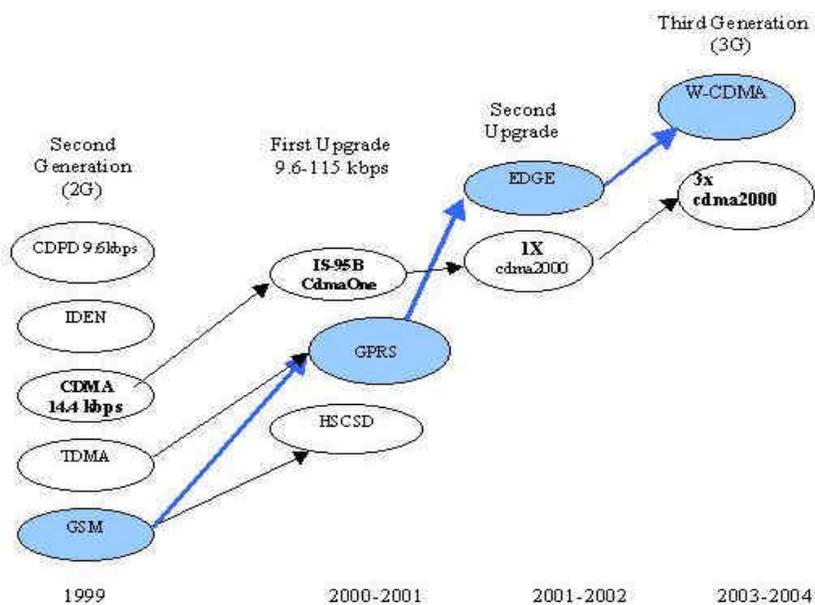
Source: [www.3Gamericas.org/.../Technology\\_Center/3G\\_standards.cfm](http://www.3Gamericas.org/.../Technology_Center/3G_standards.cfm)

Figure 7-1: Major 3G Standards

<sup>58</sup> IMT-2000: International Mobile Telecommunications 2000 is the ITU globally coordinated definition of 3G covering key issues such as frequency spectrum use and technical standards. Multiple radio technology options have been included in the IMT-2000 standard to allow seamless service evolution from the various 2G mobile standards that are extensively deployed around the world.

WCDMA is the 3G standard backed mainly by European manufacturers.

WCDMA is designed to be built upon existing GSM networks and provides a smooth migration path for current GSM system operators. CDMA2000 is the 3G standard developed by the CDMA Development Group (CDG) and favored by the U.S. manufacturer Qualcomm. CDMA2000 derives from the second generation narrowband CDMA One digital standard and provides a clear evolutionary path for existing CDMA One operators. Figure 7-2 depicts the typical migration paths for CDMA and GSM<sup>59</sup>.



Source: [www.nuntius.com/technology2.html](http://www.nuntius.com/technology2.html)

Figure 7-2: Migration Path to 3G

TD-SCDMA was proposed by the Chinese Academy of Telecommunications Technology (CATT). In April 2001, Datang Telecom, that is the primary Chinese

<sup>59</sup> It is worth noting that GSM can migrate to CDMA2000 and CDMA can also migrate to WCDMA. However, GSM/WCDMA and CDMA/CDMA2000 paths are the most cost-efficient.

supporter and manufacturer of TD-SCDMA, and Siemens finished the first calling test on a TD-SCDMA trial network. In October 2001, Datang and Siemens finished the first field trial test, completing mobile-originated, mobile-terminated, and mobile-to-mobile calls, calls from a TD-SCDMA terminal to a GSM terminal and high-speed video calls. In order to expedite the commercialization process of TD-SCDMA, the TD-SCDMA Development Alliance was formed in October 2002. Technically speaking, TD-SCDMA provides an alternative migration path to GSM operators.

### **7.3 Standards Setting In China: Stakeholders and Their**

Compared to WCDMA and CDMA2000, TD-SCDMA is still in the early stage of commercialization. TD-SCDMA's fate lies largely in the domestic cellular market. However, the mysterious standards setting process in China makes it difficult to predict the outcome of the 3G standards competition. Standards setting usually takes one of two forms: market-based and committee-based. However, in China, it is not a typical committee-based model because there is no such committee, either official or unofficial. Since all the Chinese telecommunications operators are state-owned enterprises and generally have no authority to decide on those essential and sensitive issues such as standards-setting, it is not a typical market-based model either. A question many foreign investors often ask is who is making the decision in China. This question has not become any easier, if indeed not more complicated, to answer now compared as 10 years ago when the Communist Party was the only decision-making body. In the transition to a

more open and pro-market economy, standards setting has become an arena where interest groups show off their powers.

### **7.3.1 The Chinese Government**

Using domestic markets to support domestic manufacturers has been one of the most important goals of the Chinese government. By supporting domestic manufacturers, the Chinese government hopes to improve the technological level of the local high-tech industry and help it compete with foreign competitors. In the early 1980s, the Chinese government took a four-stage strategy called “import, digestion, absorption, and creation” to help domestic manufacturers catch up with the global technology advancements. In addition to giving favorable policies and direct support to domestic manufacturers, in terms of research grants, low interest loans, discounted tax rates, etc., the Chinese government urged foreign high-tech manufacturers to transfer their technologies to China through joint ventures. The potentially huge Chinese market has enabled the Chinese government to successfully persuade foreign manufacturers to accept its terms and conditions regarding technology transfers. For example, Shanghai Bell, the first joint venture in telecommunication equipment manufacturing, debuted in 1984 with very detailed and precise terms on which technologies should be transferred to China and in what manner (Tan, 2002). After domestic manufacturers were able to supply their own equipment, the Chinese government used its administrative and regulatory power to help domestic manufacturers gain market share. An example was the MII-hosted annual conference which gathered all the telecommunications operators and major domestic

equipment manufacturers to coordinate the demand and supply of domestic-made switching equipment.

Chinese domestic manufacturers have achieved great success in switching and transmission equipment manufacturing. Several domestic manufacturers are well established. Julong, Datang, Zhongxin (ZTE) and Huawei, usually referred as Ju Da Zhong Hua (stands for Giant China in Chinese), are the flagships of China's telecommunications manufacturing industry. In 1998, those domestic manufacturers supplied 98% of the newly built switching equipment for fixed local networks and 50% of that for the transmission system (Y. Xu & Pitt, 2002). Moreover, the Chinese manufacturers have begun to export high-tech equipment to other developing countries in East Asia, Central Asia, Eastern Europe, and Latin America. The total revenue from the exportation of telecommunications equipment reached \$9.23 billion in the year of 2002 ("The Strategy of Communications Equipment Exportation", 2003).

The success in the switching and transmission sectors encouraged the Chinese government to move more aggressively into the wireless sector. In January 1999, the State Council issued an order titled "Several Issues Concerning Speeding up the Development of China's Wireless Communications Industry" in which the Chinese government planned to allocate a special fund to support research and development in wireless technologies. Major domestic manufacturers began to supply core wireless network equipment since 1999. By the end of 2000, the domestic manufacturers had secured 12 percent of wireless switching and 10 percent of base-station markets. ZhongXin even won a \$225 million contract to supply GSM equipment to a Yugoslavian operator. In the consumer electronics sector, the Chinese government issued 10 licenses

to domestic manufacturers to produce cell phone handsets. By the end of 2002, the market share of those 10 licensees had exceeded 30 percent. In terms of R&D, domestic manufacturers are now in the transition from “absorption” to “creation”. Particularly in CDMA, domestic manufacturers have gained intellectual property rights on many of the key CDMA technologies. Domestic manufacturers won approximately 40 percent of China Unicom’s CDMA IS-95 national network in 2002.

### **7.3.2 Telecommunications Operators**

By the end of February 2006, China had a total of 404 million wireless subscribers, ranking first in the world. Since the former China Telecom launched the first generation analog wireless system in GuangZhou city in November 1987, the number of subscribers increased at an average annual rate of over 200 percent (Lin, Liang, & Wan, 2001). Currently, there are only two companies serving the world’s biggest market: China Mobile and China Unicom. In addition, China Telecom and China Netcom operate a quasi-mobile PHS service called “Little Smart” in more than 200 cities with more than 87 million subscribers by the end of February 2006.

In the PTT model, China’s operators had little power to choose the technology they would use in their networks. The government picked the technologies directly. Operators participated in the standards setting process by providing technical references. However, having been separated from the regulator, especially when they are now listed in the foreign stock markets and are publicly-traded companies, the Chinese operators have begun to have more flexibility in their business decisions.

### 7.3.3 The Manufacturers

Domestic manufacturers' role in standards setting is relatively weak. TD-SCDMA is the first domestically developed advanced telecommunication standard. TD-SCDMA was originally developed by the CATT, which was the national research institute of the MII before it was re-constructed under the national policy of science and technology architecture reform and named Datang Telecom Technology and Industry Group in 1998. Datang has 12 research institutes and centers, 7 shareholding companies and 1 designing institute. Unlike other domestic manufacturers, Datang evolved from a national research institute, which emphasized research more than manufacturing. Furthermore, Datang has been a state-owned enterprise since its beginning and shares many of the common problems of state-owned enterprises, e.g. such as low efficiency, and inflexibility to meet market demand. On the other hand, Datang has its comparative advantages as well. Being a national key research institute for over 40 years, Datang has many more experienced researchers and engineers than any other domestic manufacturers. The traditional close connection with the MII also helps Datang secure preferential support from the government.

Siemens, TD-SCDMA's only foreign partner, has invested several hundred million Euros in developing TD-SCDMA and it recently announced the injection of a further 50 million Euros in the current fiscal year to advance the development of the standard. Some 300 Siemens engineers are now working on the TD-SCDMA project and half of them are employed in China.

The attitudes of Siemens and Datang towards TD-SCDMA are somewhat different. It is clear that the focus of Siemens is on the WCDMA standard. On its website, Siemens declares that although it expects TD-SCDMA to be widely deployed worldwide, it considers TD-SCDMA as a supplementary technology to WCDMA and predicts that WCDMA will be the dominant 3G standard in the future. Compared to billions of dollars thrown into WCDMA, Siemens' investment in TD-SCDMA is very small. For Siemens, investing in TD-SCDMA is strategic. Should the Chinese government choose TD-SCDMA, Siemens would be the first foreign manufacturer to serve China's huge market. However, if the Chinese government decides not to adopt TD-SCDMA, Siemens will still get compensated from the Chinese government for helping China develop its own standard. However, for Datang, TD-SCDMA is a gamble. Wireless technology is the weakest part in Datang's product portfolio. In 2G, Datang's market share in CDMA is only 2 percent. Since Datang has invested most of its resources in TD-SCDMA, currently it is unable to supply either WCDMA or CDMA2000 equipment. Should TD-SCDMA be abandoned in the future, Datang would probably get nothing in 3G.

Other manufacturers, both domestic and foreign, do not show much interest in TD-SCDMA. Siemens is the only foreign partner so far. Most major domestic manufacturers seem to lack interest in TD-SCDMA. Huawei announced that they would focus on WCDMA, while ZTE's emphasis is on CDMA2000. Unlike multinational manufacturers, domestic manufacturers do not have enough financial or technical resources to follow up all the emerging new standards. Focusing on a single standard is a reasonable choice for them and will help them secure at least part of China's future domestic 3G market. Although Datang organized the TD-SCDMA Alliance, which all

major domestic manufacturers joined, in October 2002 with the help of the Chinese government, the structure of this Alliance was very loose and there were no obligations for the members. Even after the announcement of 3G spectrum allocation, which was very favorable to TD-SCDMA, there is still no significant progress in cooperation on the development of TD-SCDMA.

## **7.4 Standards Setting With Chinese Characteristics**

### **7.4.1 Some Precedents in Standards Setting**

#### **7.4.1.1 The Choosing Of GSM**

When setting standards for the 1G and 2G wireless systems, technical specification was the most important aspect. Li, who was the Vice President of China Unicom, summarized three reasons for choosing GSM as the second generation wireless standard namely: maturity (GSM was the first commercialized 2G standard), the ability of automatic roaming and openness (the GSM standard was open and the price of network equipment was relatively low due to competition) (Z. Li, 1995). Li added that the success of GSM is also attributed to the slow commercialization of CDMA (Z. Li, 1995).

#### **7.4.1.2 Unicom's "New Horizon": CDMA**

The choosing of CDMA was a result of the joint forces of political and competitive pressures. On the supplier side, the American government was keen to promote the CDMA standard in China, while the Chinese government wanted to leverage its huge market to push the United States to support China's accession to the WTO. In addition, since domestic manufacturers had obtained more CDMA intellectual property rights than GSM and were ready to supply CDMA equipment, they also urged the Chinese government to choose CDMA. On the demand side, for China Unicom, CDMA was considered to be a great opportunity. China Unicom had long been bothered by its public image as a low-quality cheap operator. China Mobile controlled most of the high-end GSM subscribers. It was difficult for China Unicom, as a market follower, to differentiate itself by the quality of its service. However, it was relatively easier for China Unicom to differentiate itself by technology. China Unicom was very enthusiastic in lobbying the Chinese government to adopt the CDMA standard. They had advertised the CDMA technology in all kinds of mass media as a clean, healthy and high-quality technology even before the Chinese government decided to adopt it. Unicom had 33 million CDMA subscribers by the end of 2005 (MII, 2006).

#### **7.4.1.3 China Telecom's PHS**

PHS is the first and the only standard chosen directly by the telecommunications operator in China. However, as discussed in Chapter 5, the choosing of PHS is a complicated story. Facing a continuously decreasing profit margin in the fixed-line

market, China Telecom was eager to provide wireless service. Without a cellular license, it is impossible for China Telecom to choose the mainstream GSM or CDMA standards. China Telecom used the PHS standard to circumvent the regulatory barrier. China Telecom insists that the PHS technology is an extension of the fixed-line telephone network. The government's attitude toward the PHS service is ambiguous. The MII announced several contradictory orders over about four months regarding the PHS service. The final conclusion was that the PHS service should be limited to middle and small cities. However, there is no clear definition of the size of the city. The case of PHS reveals that China's operators have begun to use standards to bypass regulatory barriers and further influence the regulator's decisions using their market power.

#### **7.4.2 3G: A Prolonged Process**

The dynamics among the government, carriers, and manufacturers makes the outcome of China's 3G standards setting difficult to predict. The standards-setting is influenced not only by technical and business factors, but also by politics. Figure 7-3 depicts the analytical framework of China's 3G standards setting.

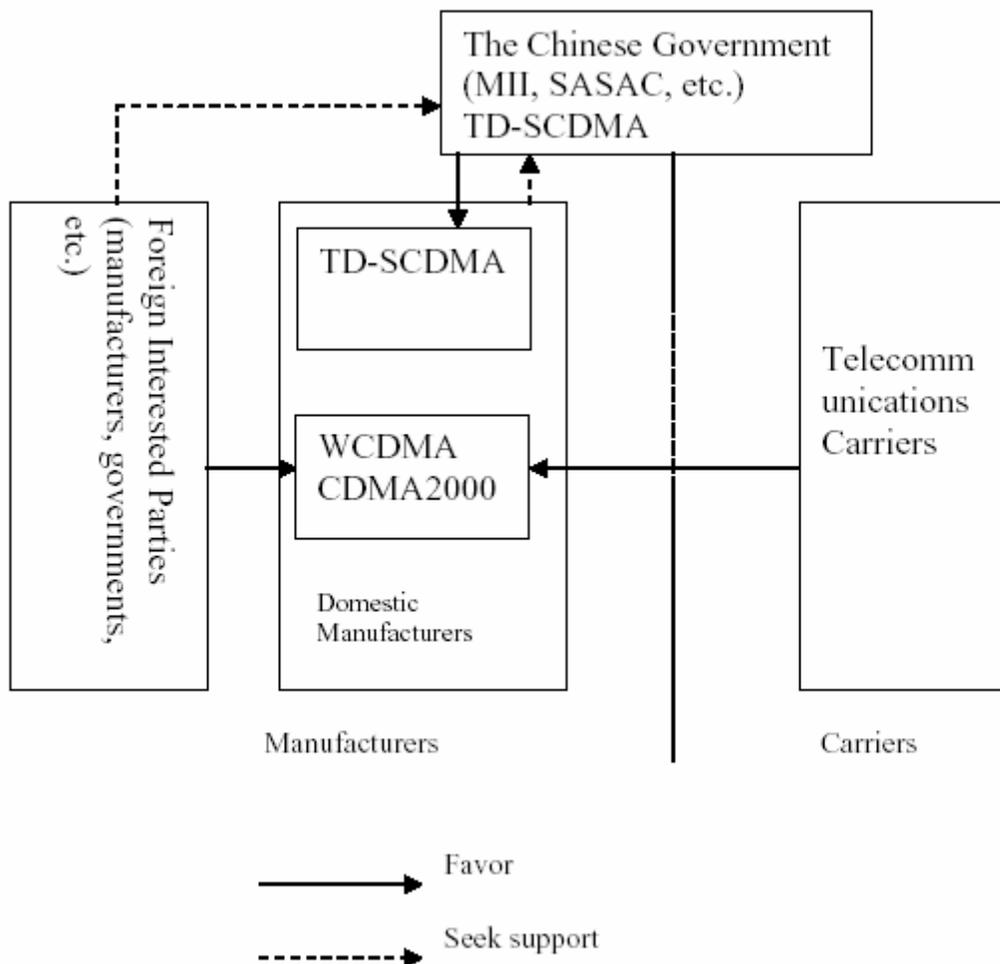


Figure 7-3: 3G Standards Setting in China

The Chinese government will continue to support TD-SCDMA. Explicitly, the Chinese government allocates special R&D funding to support TD-SCDMA from various sources. The TD-SCDMA project is one of the key national research programs. The MIIT, Ministry of Science and Technology, and several research universities coordinate on this project. The Chinese government also supports TD-SCDMA indirectly. First, the Chinese government allocates 155MHz unpaired spectrum and 60MHz paired spectrum for 3G (see Table 7-1). Since TD-SCDMA is the only 3G standard requiring unpaired spectrum,

the spectrum allocation plan provides strong incentives for operators to adopt TD-SCDMA in order to efficiently use the scarce spectrum resource. Second, the Chinese government has postponed issuing 3G licenses several times, stating that the 3G technology is not mature enough and the market demand in China is not clear. However, observers generally agree that the purpose of the Chinese government is to give more time for the domestic manufacturers to commercialize the TD-SCDMA standard. Doing nothing in standards setting right now is actually helping the domestic standard to catch up with the global leaders.

---

Table 7-1: 3G Spectrum Allocations in China

FDD (Paired)(60M Available)	TDD (Unpaired)(150M Available)
1920-1980 MHz / 2110-2170 MHz	1880-1920MHz 2010-2025 MHz 2300-2400MHz

---

The operators are ambivalent about TD-SCDMA. China Unicom operates both GSM and CDMA now. It is unlikely that Unicom will upgrade its old GSM network to 3G since they have shifted their focus to the new CDMA network. The migration path from CDMA to CDMA2000 is the most cost-efficient. China Mobile has upgraded part of its network to 2.5G to offer the GPRS<sup>60</sup> service. It is a natural choice for China Mobile to go for WCDMA beyond GPRS. Both China Telecom and China Netcom have already constructed trial 3G networks based on CDMA2000 and WCDMA respectively. To some

---

<sup>60</sup> GPRS: Short for *General Packet Radio Service*, a standard for wireless communications which runs at speeds up to 115 kilobits per second, compared with current GSM (Global System for Mobile Communications) system' 9.6 kilobits. GPRS is the middle step from the current GSM to the future WCDMA.

extent, the attitudes of China Telecom and China Netcom will determine the fate of TD-SCDMA. As discussed before, although China Telecom and China Netcom are now running PHS service nationwide, they do not have official cellular licenses. When they will get cellular licenses, and what license, 2G or 3G, they will get are not clear due to the ambiguous and contradictory statements from the MII. However, it is clear that they will get one sooner or later, most likely when the Chinese government considers TD-SCDMA mature. TD-SCDMA can then be used by China Telecom and China Netcom to bargain for more favorable regulatory terms with the Chinese government. On the other hand, should China Telecom or China Netcom choose TD-SCDMA, the commercialization progress will speed up significantly. More manufacturers, foreign and domestic, will participate and the risk of using immature technology will be reduced. For all the Chinese carriers, the threat of switching to TD-SCDMA will give them more bargaining power in the negotiation with WCDMA or CDMA2000 manufacturers. The case of TD-SCDMA is an example of the old “chicken and egg” dilemma. If Datang could not persuade operators to adopt TD-SCDMA, it would be difficult for Datang to attract other manufacturers to participate in the commercialization of TD-SCDMA. However, if the technology is not mature, few operators want to take the risk.

Technologically speaking, TD-SCDMA seems to have its market niche. TD-SCDMA is the only standard designed to use unpaired spectrum. Since both WCDMA and CDMA2000 use paired spectrum, TD-SCDMA avoids head-to-head competition with them. It is clear that Datang will continue to strengthen its lobbying for government support. Datang will strengthen its “National Hero” campaign to seek support from the media and public. However, Datang has not done well in marketing its TD-SCDMA

standard to other manufacturers in the past. It is clear that Datang's only foreign partner, Siemens, is more interested in political gain from TD-SCDMA. Most multinational telecommunications manufacturers, intentionally or unintentionally, neglect the existence of TD-SCDMA. Even China's domestic manufacturers do not show much interest in TD-SCDMA. Without cooperation, it is difficult, if not impossible, to commercialize such technology as a wireless standard. To what extent Datang is willing to open its standard and share its intellectual property rights with its competitors will to a large extent determine the ability of Datang to attract more investors.

Other factors may also affect the development of TD-SCDMA. Since TD-SCDMA is based on CDMA technology, inevitably, it will face the issue of intellectual property rights with the American company Qualcomm, which has most of the basic patents for CDMA. Lupin, senior vice president and general counsel for Qualcomm, said TD-SCDMA manufacturers would have to get a license from Qualcomm if they wanted to move forward with the commercialization of the TD-SCDMA standard (Clendenin and Mannion, 2002). Datang rejected Qualcomm's claim. Zhou Huan, chairman of Datang, said that the core technology of TD-SCDMA was developed by the Chinese researchers and did not use Qualcomm's patented technology ([3Gnewsroom.com](http://3Gnewsroom.com), 2002). Siemens's attitude is very clear that TD-SCDMA so far has not adopted any patent of Qualcomm's. However, Siemens admits that it is possible to use some of Qualcomm's patents for the purpose of commercialization in the future. Lothar Pauly, head of Siemens' wireless division, said currently TD-SCDMA was not based on Qualcomm's technology and Siemens did not plan to pay licensing fees ([3Ginsight.com](http://3Ginsight.com), 2001). Recently, Datang has shown its willingness to negotiate with Qualcomm on the intellectual property right

issues. However, it is difficult to know the details and predict the outcome of their possible negotiation given the limited resources available so far.

## 7.5 Prospects

Standards-setting usually takes on two forms: *de facto* and *de jure*. America has taken the former approach which results in three different 2G standards in the U.S. market. European countries, hoping to achieve a unified pan-Europe wireless network, take the other approach. The standards selected by the ETSI<sup>61</sup> usually become mandatory for all European countries. In a transition from a planned economy to a pro-market one, China's standards setting reflects some new characteristics.

### 7.5.1 Balance seeking

China does not have a formal standards setting organization and the government chooses the standards directly through its regulatory agency. The Chinese government still has great influence on the standards setting process. However, with the opening of the telecommunications market under the WTO agreement, the government has had to make a compromise with investors, especially foreign investors. In order to support TD-

---

<sup>61</sup> ETSI: the European Telecommunications Standards Institute is a not-for-profit organization whose mission is to produce the telecommunications standards that will be used for decades to come throughout Europe and beyond. ETSI plays a major role in developing a wide range of standards and other technical documentation as Europe's contribution to world-wide standardization in telecommunications, broadcasting and information technology. ETSI's prime objective is to support global harmonization by providing a forum in which all the key players can contribute actively. ETSI is officially recognized by the European Commission and the EFTA secretariat.

SCDMA, the government has reserved more unpaired spectrum hoping to encourage the telecommunications carriers to adopt TD-SCDMA which is the only 3G standard riding on unpaired spectrum. The government also helped Datang to form an industrial alliance to facilitate its commercialization. Moreover, the Chinese government has postponed issuing the 3G license several times in order to give TD-SCDMA more time to catch up with its competitors. However, little headway has been made. Operators are still reluctant to accept TD-SCDMA. Other manufacturers are still not as active as expected. It is worth noting that all the major Chinese domestic manufacturers<sup>62</sup> are also state-owned enterprises. Since the MEI was abolished, the electronic manufacturing industry has been supervised by the MII. Should the MII exclusively select Datang's TD-SCDMA, other domestic manufacturers, which have invested heavily in other technologies, would inevitably incur huge losses. As revealed in previous chapters, the MII has the intention of avoiding the political risk of losing the value of state assets under its supervision. Thus, it is expected that some compromise needs to be made among the many domestic manufacturers by the MII.

### 7.5.2 Who Is Captured?

Hu Angang, a professor of Tsinghua University, published a very controversial research report in which he argues that the reason for the delay of 3G in China is that the Chinese government is captured by interest groups (A. Hu, 2005). Although he does not

---

<sup>62</sup> Except Huawei.

mention who the members of those interest groups are, he implies that the Chinese government is concerned about the national security issue of using foreign-owned advanced technologies (A. Hu, 2005). This report has generated a hot debate in China's policy circles and has been criticized by many commentators. Kan Kaili, a professor of Beijing University of Posts and Telecommunications, argues that Hu Angang's report fails to provide any evidence of the so-called "capture theory" (Huang, 2005). Moreover, Li Jingliang, a professor of Nankai University, who sits on the advisory board of the MII, argues that, in fact, telecommunications carriers, which are pushing hard for 3G licenses, are captured by foreign multinational manufacturers (Jin, 2006).

### **7.5.3 Another PHS?**

Standards can be used by the operator to differentiate itself from its competitors. Standards can also be used to promote competition in service quality. In China, both strategies are being practiced. Particularly, standards are used by the Chinese carriers to negotiate favorable regulatory policies with the regulator. Without the carriers' cooperation, TD-SCDMA could not even get a chance to construct a trial network. The regulator also has to depend on the carriers to test the technical specifications of TD-SCDMA. The Chinese carriers are also able to negotiate with the regulator for more favorable regulatory terms in return for the risk of adopting immature domestic technology. It is also noted that local branches of the Chinese telecommunications carriers are very powerful in making business decisions. As discussed in Chapter 5, government policy and regulation often are not effective at or below the provincial level.

It was recently reported that although China only planned to build eight 3G trial networks, and asked all the operators to participate in the trial of three standards, China Mobile, China Telecom and China Netcom in total built more than 800 WCDMA base stations and over 80 related networks without the approval of the MII ("MII Puts Brake on WCDMA Trial Network Construction", 2006). In many cities, it is an open secret in the industry that those carriers are able to provide the 3G service the day after they get the license. The massive and unauthorized built-up of WCDMA networks reminded the regulator of the uncontrolled growth of the PHS. It was reported that the MII, along with the SASAC, had sent out high-level officials to provincial branches, trying to slow down the overheated construction ("MII Puts Brake on WCDMA Trial Network Construction", 2006). However, it is doubtful how effective the measures will be given the highly decentralized management structure of China's telecommunications industry.

## **7.6 Concluding Remarks**

TD-SCDMA has become a weapon for every stakeholder in China's standards setting. Government could use it to help domestic manufacturers as well as to bargain with foreign manufacturers for favorable terms for the use of intellectual property rights. Domestic manufacturers could use it to advance their technological level. Carriers could use it to negotiate better deals with manufacturers and the regulator. Having its own standard will help China gain a better position in international trade negotiations. However, the outlook for TD-SCDMA is probably not as optimistic as Datang is

expecting. It is most likely that TD-SCDMA will become a complementary 3G standard in the long run.

The Chinese government will continue to support TD-SCDMA. The development of such a sophisticated standard provides a valuable chance for China to construct an advanced technological system. The standardization and building of the Nordic mobile telephone system was a significant phase in the development of mobile telecommunications from the perspectives of operators, manufacturers, and the standard-setting process (Lehenkari & Miettinen, 2002). The success of the Nordic mobile telephone system has not only created giant companies like Nokia and Ericsson, but also helped those countries leapfrog into the information society. The Chinese domestic manufacturers will benefit significantly from the experience of TD-SCDMA whether or not this standard is a success or failure in the future.

## Chapter 8

### THE FUTURE OF CHINA'S TELECOMMUNICATIONS: RESTRUCTURING THE REGULATORY REGIME

#### 8.1 A Brief Summary of the Cases Studied

Three cases have been studied in the previous chapters. Collectively, the cases studied provide a broad picture of how China's system works and what the "Chinese characteristics" are. But the three cases have their own emphases respectively.

The discussion of PHS focused on the formation of the market. On the one hand, the debut and rapid growth of the PHS service was a result of competition. On the other hand, it was also a byproduct of a government regulatory regime that is often inefficient, if not antagonistic, in response to the rapidly changing demands of the market. In terms of regulation, the case of IPTV revealed that the current "silo" model of regulation might hinder the advancement of technology represented by the convergence of telephone, television and the Internet. The bureaucratic turf war among government ministries had a significant impact on the market structure. The case of 3G was worth studying because it is the first time that China has had the opportunity to compete with multinational telecommunication giants in terms of advanced technologies. In addition, 3G comes at the time when the Chinese government has to open its domestic telecommunications market to foreign investors under its commitment to the WTO, which provides foreigners more opportunities to influence China's policy making. The decision made on 3G will have a long-term impact on China's future high-tech policy.

## **8.2 Problems and Issues of the Current Market and Regulatory Structures**

### **8.2.1 The Current Regulatory Model Refined**

China's telecommunications regulation is fragmented. Vertically, value-added services, wireline services, wireless services, television services, and manufacturing are treated separately, some of which are open to competition while the others are under the tight control of the government. Horizontally, decision making is shared by the central and local governments, carriers' headquarters, and provincial branches, which provides variety, but also unpredictability. The bureaucratic turf war among different government agencies remains even after several restructurings. The effort to modernize the Chinese carriers' corporate structure has brought more confusion than clarification. Built upon the analytical model proposed in the Chapter 4, Figure 8-1 depicts a refined model of the market structure and regulatory regime of the Chinese telecommunications service industry (see Figure 4-5).

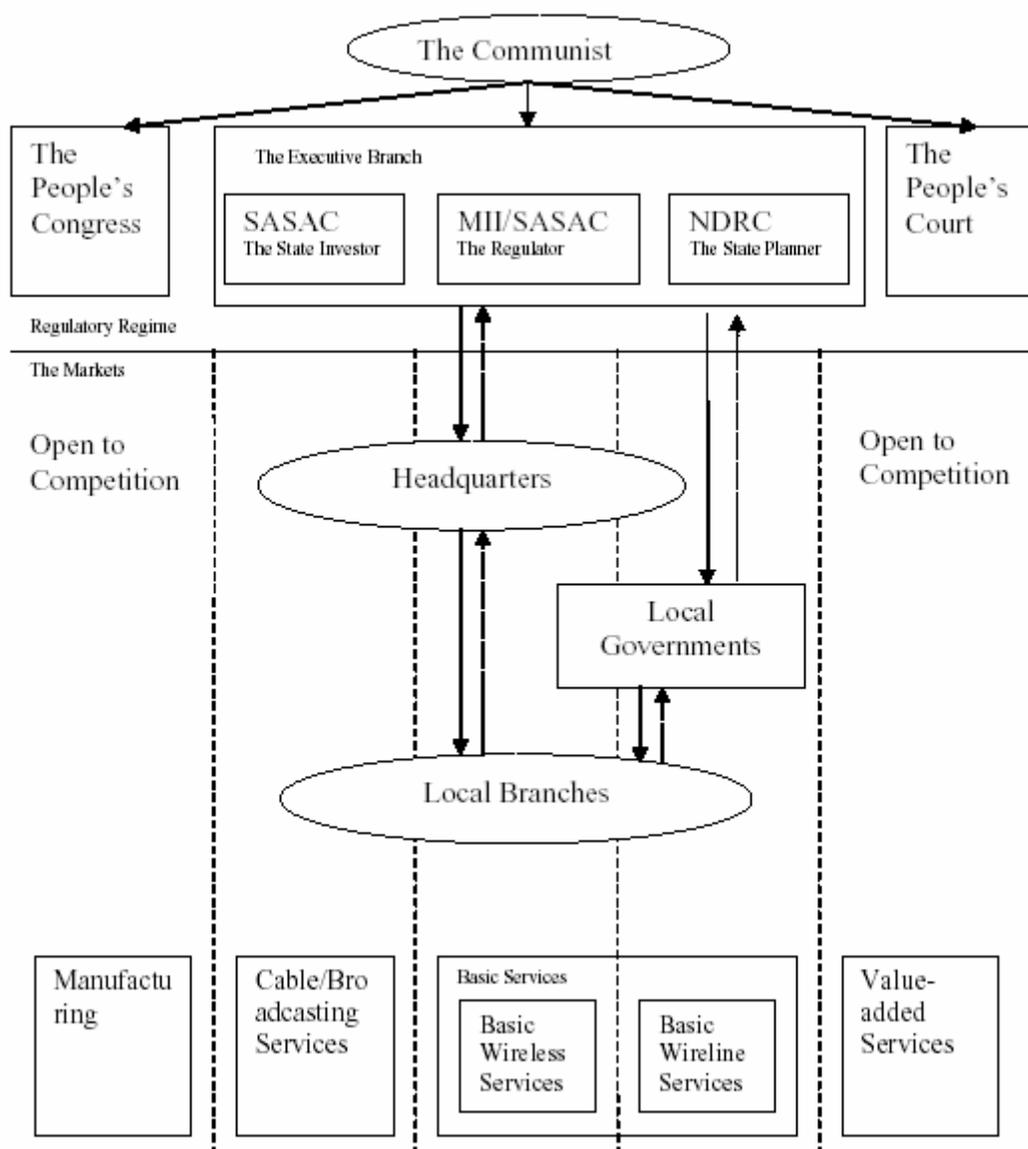


Figure 8-1: The Market Structure and Regulatory Regime of the Chinese Telecommunications Service Industry

## 8.2.2 Issues

### **8.2.2.1 Vertical Separation: the “Silo” Approach**

Generally speaking, the current regulatory model follows the “silo” approach. Television (including cable, broadcasting and radio) and telecommunications are regulated by different government ministries. Within telecommunications, value-added and basic services are treated differently. In addition, wireless and wireline carriers are prohibited from entering each other’s service domains.

The separation of television and telecommunications is a result of government design. Since 1949, television and telecommunications have been regulated by different government agencies. With the advance of new digital technologies, both networks and their regulators are trying to maintain monopoly power over their traditional service domains and penetrate into each other’s turf. In 1999, the State Council’s Decree 75 reiterated the national ban on network convergence. Since then, no license has been issued to television companies to offer telecommunication services by the MII, and the SARFT has strictly prohibited telecommunications carriers from entering the television market. IPTV seemed to have made some progress initially but soon was held back. In addition to bureaucratic interests, content control is another important concern of the Chinese government regarding opening the television market for competition.

The separation of wireless and wireline services had its origin in the effort to introduce deregulation. The failure of the attempt to establish a major full-fledged competitor in the early 1990s led the Chinese government to break up the then-monopoly of China Telecom into the new China Telecom and China Mobile, focusing on wireline

and wireless services respectively, in 2001. Since then, no additional licenses have been issued.

The traditional “silo model” is no longer adequate in three respects. First, the silo model’s basic assumption that distinctions between individual services are clear is no longer adequate. In a converged network, traffic can ride on any type of platform. For example, PHS is a wireless access technology riding on a wireline network. However, from the end-user’s perspective, PHS seems to be no different than other mainstream wireless services, such as GSM, CDMA, etc. IPTV, which uses the broadband network to deliver television programs, is another example. Should a service be regulated according to its technological characteristics or the service actually rendered? Second, as pointed out by Sicker (2002), when providers of similar services are regulated differently, it encourages some of them to take advantage of certain regulatory policies. Since the PHS service is regulated as an extension of wireline service, the PHS operators do not need to pay for the use of the wireline network, which creates an un-level playing field for other wireless carriers. Third, the “silo” model is slow in response to market changes and ineffective in implementation. The case of IPTV demonstrates that the “silo” model may hinder the development of promising technologies. On the other hand, the popularity of the PHS service shows that the commercial impetus might also grow strong enough to circumvent a regulatory barrier. The recent mass build-up of the so-called 3G experimental networks reaffirms that the “silo” model is unable to suppress the commercial interests of the carriers.

### **8.2.2.2 Horizontal Disconnection: Tensions between National and Local Interests**

The current management structure of China's telecommunications carriers is decentralized. In the late 1980s, in order to encourage provincial and local governments to participate in the economic reforms, the central government decentralized many of its powers. Although the then-MPT had responsibility for all public telecommunications operations, it only focused on public switched long-distance and international services. City and provincial authorities had important planning, operational, and acquisition responsibilities (Lerner, 1987). Although the then-MPT, and later the NDRC, established all rates and tariffs for basic telecommunications services, local rates could be adjusted unofficially by provincial and metropolitan authorities (Lerner, 1987). In terms of profit-sharing, local and provincial telecommunications branches are allowed to keep most of their profits from local and intra-province services. A portion of the revenues from inter-province services is also redistributed among local and provincial branches. For China Telecom, China Mobile and China Netcom, all of which originated from the former PTT, their headquarters and provincial branches are independent juridical persons<sup>63</sup> (artificial persons). Thus, the provincial branches have substantial flexibility in making their own investment and marketing plans. China Unicom does not follow the two-tiered juridical person model. However, although Unicom's provincial branches do not have the authority to make investment decisions, they have considerable flexibility in marketing. As commented by Wu Jinglian, an economics professor of Peking University and outside

---

<sup>63</sup> According to Merriam Webster's Dictionary of Law (1996), a juridical person is an entity (as a partnership or corporation) that is given rights and responsibilities.

non-executive director of Unicom, China Unicom's single juridical person system is ineffective and far from integrated (L. Zhang, 2003).

The horizontal separation between carriers' headquarters and provincial branches has both positive and negative effects on the formation of a competitive market. On the positive side, local and provincial branches have strong incentives to generate revenues from locally-centered services, which results in a highly competitive and dynamic local market. As revealed in the case of PHS, the headquarters are very passive while local branches aggressively promote the service, particularly during the first and second stage. As a matter of fact, the tariff for locally-centered services has dropped significantly under the government-mandated standards. Table 8-1 depicts an example of different cellular service plans in Chengdu city, capital of Sichuan province. Due to fierce competition, the price of the GSM local plan is set almost at the same level as the PHS service.

Table 8-1: An Illustration of the Telecommunications Service Plan in Chengdu City

Plan	Monthly access fee	Price per minute	Roaming	Calling Party Pay	Carrier
Local Phone	18	0.1	n/a	Y	China Telecom
PHS	18	0.2	No	Y	China Telecom
GSM Global	50	0.4	Yes	N	China Mobile
GSM Local	20	0.2	No	Y	China Mobile

Source: <http://www.cdtelecom.com.cn>, <http://www.sc139.com.cn>

In the case of IPTV, although there exists a national ban on cross-entrance, local cable operators have incentives to cooperate with telecommunications carriers to utilize

their networks to provide telecommunications services. For telecommunications carriers, setting up joint-ventures with those SARFT companies which have been issued IPTV licenses is probably the most feasible way to circumvent the regulatory barrier.

However, the conflict between local and national interests can not be easily resolved under the current decentralized management structure, which already has had some negative impacts on the market. First, it is difficult to promote services that need nationwide coordination. Citing the slow progress made in the toll-free 800 service and the corporate virtual private network (VPN) service, Kan Kaili, a professor of Beijing University of Posts and Telecommunications, argues that local interests are the biggest obstacle to the Chinese carriers providing nationwide new services (B. Li, 2003). In the cable market, since every province, if not every township, has its own cable operator, the SARFT has had great difficulty meeting its digital TV upgrading time-table. Second, fragmentation often results in unplanned, sometimes overheated, network construction. The rapid built-up of the PHS networks is an example of such unplanned investment. In the 3G, although the Chinese government only planned to build eight 3G trial networks and asked all the operators to participate in the trial of three standards, China Mobile, China Telecom and China Netcom have built more than 800 WCDMA base stations and over 80 related networks without the approval of the MII ("MII Puts Brake on WCDMA Trial Network Construction", 2006). It will not be surprising if those carriers offer 3G service the day after they are licensed. Third, government regulation is often ineffective at the local level. Since the headquarters do not operate the networks and compete in the market directly, their interaction with the regulator has limited influence on the market, particularly if such services are categorized as local services. In addition, since the major

carriers are all directly owned and supervised by the SASAC, the provincial regulators' role is rather weak. As commented by a participant in the East-West Expert Dialogue<sup>64</sup>, provincial regulators' role is "next to 0".

### **8.2.2.3 The Regulatory Regime**

In China, generally speaking, the impact of the legislative and judicial branches on telecommunications regulation is limited, if any. Unlike the United States which features shared powers among legislative, executive and judicial branches, China has a powerful Party-controlled government with weak legislative and judicial systems. The National People's Congress and its Standing Committee are supposed to exercise the legislative power. However, in reality, they work more like the Party's "rubber stamp". Moreover, being regarded as the enforcement unit of the Party, China's judicial system has never been truly independent.

Despite the absence of a telecommunications law and an effective and formal judicial system, China has attracted a large portion of global foreign direct investments in telecommunications manufacturing. China's telecommunications service industry has also experienced extraordinary development. There might be many reasons for China's achievement. However, there is no doubt that, without the Chinese government's firm

---

<sup>64</sup> An East-West Expert Dialogue: Regulation and Telecommunications Market Development in China, which was held in Washington, D.C. September 28-30, 2004, was an academic meeting of U.S. and Chinese scholars and experts to discuss issues of mutual interest in telecommunications policy and how they might relate to ongoing developments in China, particularly issues relevant to China's draft telecommunications law. This conference was sponsored by East - West Center, United States Asia Pacific Council, Beijing University of Posts and Telecommunications, The Pennsylvania State University Institute for Information Policy.

determination and strong support, China's telecommunications could not possibly have achieved today's success. A strong government benefits the telecommunications industry in two ways. First, it can concentrate limited resources in some specific preferential sectors and facilitate such sectors to grow at a remarkable speed. The quick jump-start of telecommunications in the 1980s is a typical example. Second, the quasi-autocratic political system can promise long-term political stability, which is essential for industries requiring long-term investment, such as telecommunications.

Within the government, regulatory power is distributed among several government agencies. Supposedly, the MII is a super-agency that oversees telecommunications, multimedia, broadcasting, cable, satellites, and the Internet. However, in practice, due to the concerns of propaganda and content control, the television industry, including broadcasting, cable and satellites, are regulated by the SARFT. As discussed in Chapter 6, the separation of telecommunications and television has significantly slowed down the development of China's IPTV market.

In addition to the bureaucratic turf war between the MII and the SARFT, the relationship between the state investor (the SASAC) and the regulator is unclear. Although the major Chinese telecommunications carriers, and also some influential manufacturers, are publicly-traded companies, the SASAC is the dominant shareholder (see Figure 8-2).

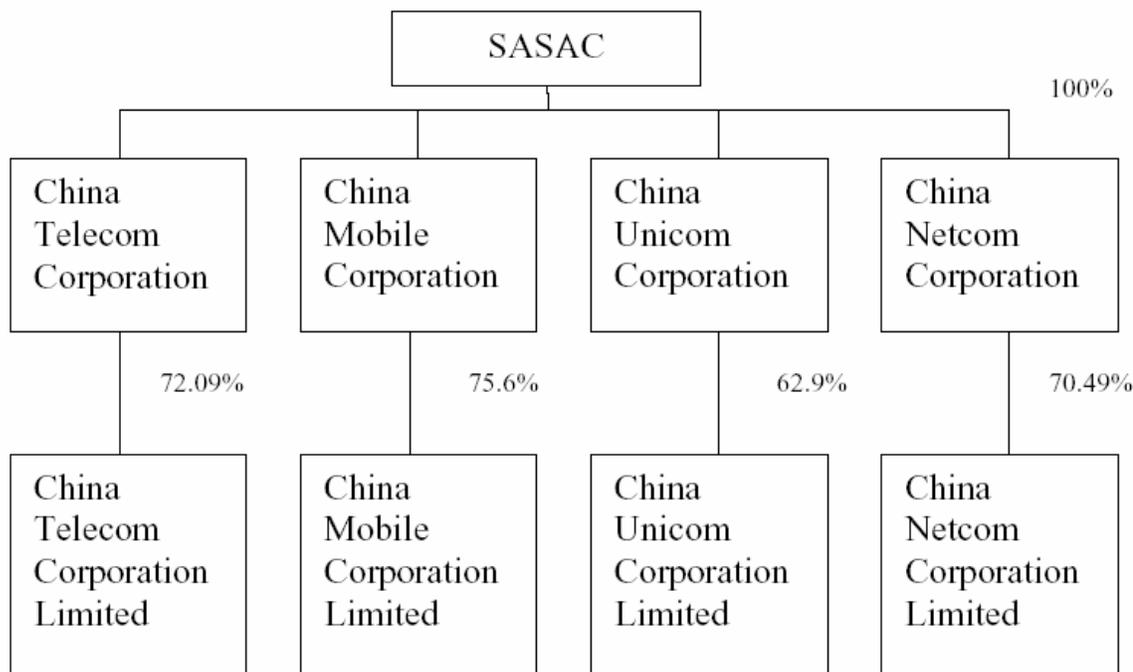


Figure 8-2: Shareholder Structure of China's Major Telecommunications Carriers

The creation of the SASAC aims to establish a modern corporate structure for state-owned enterprises. However, it brings more myths instead. First, due to the lack of expertise and human resources, the SASAC does not take on supervisory responsibility directly. Instead, carriers' headquarters are designated as the representative of the state. Therefore, those who sit on the board of directors are senior executives at the same time. The effort to distinguish the responsibility of investor from executive is far from successful (W. Lu, 2005). The unclear corporate ownership structure results in distorted competition. In China, the most common type of competition in the telecommunications industry is conventionally known as "price war", in which operators cut their prices fiercely. Lacking modern accounting and auditing systems, it is difficult for the state, as well as the operators themselves, to monitor the real cost. Second, since one of the most

important missions of the SASAC is to “supervise and administer the preservation and increment of the value of state-owned assets”, the MII must ensure that its regulatory policy will not cause state-owned carriers to lose value. The protection of the state-owned enterprises creates an un-level playing field for the private sector. In addition, the regulator has to make compromises among different state-owned enterprises. As revealed in the cases of PHS and 3G standards setting, the “balance seeking” approach leads to shaky stands of the regulator that are, in turn, often challenged by the regulated industry and other government agencies. Third, since the SASAC can directly “appoint and remove top executives of enterprises”, its action is often unpredictable. The reshuffle of the top executives among major operators, without any formal clarification, in November 2004, is regarded as an example of the arbitrary and potentially harmful action taken by the SASAC (Zhu, 2005).

### **8.3 Toward a New Regulatory Model**

#### **8.3.1 The Objectives of China’s Telecommunications Reform**

While there are a lot of discussions regarding how to reform Chinese telecommunications, few have looked at the objectives of such a reform. As reviewed in Chapter 2, expanding advanced telecommunications services to more and more people and reinforcing domestic carriers’ positions in face of international competition are two key objectives of China’s telecommunications regulation and deregulation. The key

objectives lay down the foundation for the policy recommendations in the sections which followed.

## **8.3.2 Proposals for Further Development**

### **8.3.2.1 The Applicability of International Experiences**

Regulatory models vary from country to country. There is no simple “best practice”. However, facing the convergence of technologies, regulators around the world generally agree that the traditional “silo model” is no longer adequate. While the Chinese policy makers should keep an open mind and learn from foreign experiences and models, it is important to bear in mind that all regulatory measures should be made in accordance with China’s social, economic and political conditions, particularly the objectives of China’s telecommunications reform.

In Chapter 2, several alternative models have been reviewed, among which the layered model and the anti-trust model have attracted great attention in policy circles and have been practiced to some extent in some countries. However, when applied in China, without significant adjustments, none of them are suitable.

The most important reason to reject the pure layered approach is its ignorance of the benefits of vertical integration. Although the advocates of the layered approach disagree that the layered model rejects vertical integration, it appears that the vertical separation and unbundling of network elements is the most practical way to assure the layer separation principle, which is the key to the success of the layered approach. In

practice, long distance companies, such as the former MCI, which usually have no or limited local loops, are the primary supporters of the layered model. Unbundling network elements lowers barrier to entry and might quickly lead to competition. However, unbundling is criticized for discouraging facility-based investment. Forming a competitive market structure is not the primary concern of the Chinese government. Thus, a policy of unbundling network elements is unlikely to be adopted in China. In addition, the layered model is not mature at this stage. There is as yet no theoretical or practical guideline on how to regulate particular layers. Should the regulator use traditional methods to regulate each layer, it introduces more complicated regulations than the “silo” model. Moreover, it has also been questioned whether or not the layered approach is truly as technology-neutral as it claims to be. The layered model borrows largely from the Internet protocol. The implicit assumption of the layered model is that the TCP/IP architecture is superior to others, which is contradictory to the spirit of network neutrality. In summary, although, at the theoretical level the concept of layering is an important analytical tool in making telecommunications policy, it is not practical in China’s telecommunications regulation.

The pure anti-trust model is not suitable in China either. The success of the anti-trust model relies on a robust competitive law and a strong, preferably independent, judicial system, which do not exist in China. Although the “Anti-Unfair-Competition Law” has been in place for over 5 years, it has never been applied to the telecommunications sector. Moreover, being regarded as a branch of the Party, the court system in China has never been, nor will be independent in the near future.

Internationally, the only country that has adopted such a model, New Zealand, has largely

given up and returned to a traditional, although comparatively light-handed, regulatory system.

### **8.3.2.2 The New Paradigm of China's Telecommunications: Principles**

Ideally, the market-based supply of telecommunications services is accompanied by less regulatory intervention, but it has been proved, although somewhat ironically, that the successful transition of a monopolistic telecommunications market to a competitive one needs very carefully designed regulatory measures.

The World Bank has summarized 8 principles of telecommunications regulation including:

- Promote universal access to basic telecommunications services
- Foster competitive markets to promote: efficient supply of telecommunications services, good quality of service, advanced services and efficient prices;
- Where competitive markets do not exist or fail, prevent abuses of market power such as excessive pricing and anti-competitive behavior by dominant firms;
- Create a favorable climate to promote investment to expand telecommunications networks
- Promote public confidence in telecommunications markets through transparent regulatory and licensing processes;
- Protect consumer rights, including privacy rights;

- Promote increased telecommunications connectivity for all users through efficient interconnection arrangements;
- Optimize use of scarce resources, such as the radio spectrum, numbers and rights of way (World Bank, 2004).

The WTO also requires its member countries to:

- Establish an independent regulatory body that is separate from, and not accountable to, any supplier of basic telecommunications services. The decisions of and the procedures used by regulators shall be impartial with respect to all market participants;
- Maintain appropriate measures for the purpose of preventing suppliers who, alone or together, are a major supplier from engaging in or continuing anti-competitive practices<sup>65</sup> (Henderson, Gentle, & Ball, 2005).

International experiences have suggested that an independent regulator and a competitive policy are the most important parts of the new telecommunications regulatory regime. However, those guidelines established by the international organizations should be adjusted to accord with the objectives of China's telecommunications policy. Regarding the issue of establishing an independent regulator, China has been very resistant to the phrase "independent regulator". Apparently, there is a common misunderstanding in China an "independent regulator" is some renegade agency outside the control of the state and the party, which is inconsistent with their culture and their guiding governmental policies (Taylor & Zhang, 2005). Ironically, one

---

<sup>65</sup> The WTO Reference Paper also has detailed requirements for interconnection and universal service. See [http://www.wto.org/english/tratop\\_e/serv\\_e/telecom\\_e/telecom\\_e.htm](http://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_e.htm)

of the primary objectives of the formation of the MII is to separate the government from the basic telecommunications carriers, which, to some extent, is the effort made by the Chinese government to meet its WTO commitment. Since the MII does not share any interest with any specific carrier, at least on the surface, the MII meets the WTO's definition of independent regulator. The real issue is the state ownership and the vague position of the SASAC. As pointed out by Taylor and Zhang, for China, focusing on the "independent regulator" is to shoot at the wrong target, the real target is substantively addressing the concerns of foreign investors (2005). Essentially, the primary concern is not the formal structure of the regulatory regime, but a regulatory policy that is fair to both state-owned and private companies. Some adjustment of the regulatory regime is expected in the face of the convergence of technologies. However, without being accompanied by the restructuring of the corporate structure of the state-owned enterprises, the effect of governmental restructuring is limited. Concerning competitive policy, since development is the primary goal of the Chinese government, priority should be given to creating a conducive environment to promote facility-based investment in telecommunications. Policies, such as unbundling network element, resale, etc, which are regarded as discouraging facility-based competition, are unlikely to be adopted by the Chinese government. Facility-based cross-modal competition, which is also expected to avoid wastefully repetitious construction, is likely to prevail in China. Lastly, in order to strengthen domestic carriers and manufacturers, the Chinese government is expected to continue giving domestic enterprises policy preferences. Domestically, the Chinese government might mandate the deployment of domestic standards. Internationally, the

Chinese government will encourage and support the overseas expansion of Chinese enterprises.

### **8.3.2.3 Towards the New Regulatory and Market Structure: A Step-by-step Policy Recommendation**

In this section, a step-by-step policy recommendation is provided. The outcome is a new regulatory model that aims to solve the existing market distortion and regulatory pitfalls in the short term, and to ensure sustainable development in the long term. The order of the steps is based on the level of difficulty.

*Step 1: Vertical integration to relieve the tension between national and local interests.* Although the disconnection between carriers' headquarters and local branches can bring dynamics to the market, it also leads to immature, sometimes over-heated, competition. In addition, government regulations are usually not effective at the local level. There are two ways to solve this problem. One is to follow the 1984 AT&T divestiture model in which the local service is completely separated from the long-distance service. Specifically in China, carriers could be broken up into provincial level companies which focus on local service, leaving the long-distance service and other inter-province services open for competition. This model reflects the reality of the current market structure. However, the Chinese government is unlikely to take this approach because it conflicts with the goal of strengthening state-owned carriers. The alternative is to strengthen the power of headquarters. Major carriers have already taken steps to limit the flexibility once enjoyed by the local branches. The provincial branches of China

Mobile lost the authority to purchase network equipment beginning in 2005. It was reported that this measure saved China Mobile up to 15 percent in network equipment purchasing (Changzhen, 2005). China Netcom and China Telecom are also expected to take similar measures in the near future (Liao, 2004).

*Step 2: Break the “silo” to encourage cross-modal competition.* The current “silo” model of regulation is no longer adequate in face of the convergence of technologies. Moreover, government-imposed restrictions often fail to suppress the commercial impetus of the commercialized carriers. The Chinese government should abandon the sector-by-sector regulatory model. In the telecommunications market, the substitution effect of wireless technology is already evident. The Chinese government should issue wireless licenses to wireline carriers and vice versa in order to facilitate cross-modal entry and leverage the scope economy. To avoid wastefully repetitive construction, the Chinese regulator should issue detailed regulations on such issues as network interconnection, network element sharing, etc. The Chinese government should also allow cross-entry of television and telecommunications. As evidenced in the U.S., the cable industry has grown into the biggest competitor of the telephone industry in the broadband access market. While content is most likely to be controlled by the government, it is feasible to open the conduit for competition. The regulatory regime should also be restructured to facilitate cross-modal competition. Accordingly, the content control function should be transferred to another government ministry. In a sense, the new regulatory structure adopts a simplified layered model where content and conduit are regulated separately.

*Step 3: Diversify the ownership structure of the state-owned carriers.* The most critical and difficult step is to diversify the ownership structure of the state-owned carriers. As discussed in Section 8.2, the dominance of state ownership results in distorted competition, an un-level playfield, “balance seeking” and unpredictable regulatory behavior. At the government level, it is imperative to clarify the different responsibilities of the SASAC (as the state investor), the MII (as the regulator) and NDRC (as the planner of the national economy). At the enterprise level, it is imperative to diversify the ownership structure of the state-owned carriers. As a matter of fact, the Chinese government has sold many of its small and medium state-owned enterprises to private or foreign investors. As pointed out by Zhang Wenkui, an economist and researcher of the State Council Development and Research Center, if some top managers and executives of non-public enterprises and former state-owned corporations can create wealth through vitalizing state assets, they should be blessed instead of blamed by the government (“SOE ownership reform-- Which direction?” 2004). However, it is important to note that diversifying the ownership structure does not necessarily mean privatization. The purpose of diversifying is to dilute the dominant position of the SASAC in telecommunications carriers in order to prevent the SASAC from manipulating the market. Private capital, state-run social security funds, other non-telecommunications state-owned enterprises, etc. should be allowed to enter the basic telecommunications service market. The diversifying of the ownership structure is the most difficult step of telecommunications reform. Since telecommunications is considered to be essential to national security, and it is among one of the few profitable public sectors, the Chinese government is very cautious in regard to private participation

in this industry. There is no sign that the Chinese government will loosen its control on the ownership of major telecommunications carriers in the short term. The SASAC declares that state-owned enterprises directly controlled by the central government shall keep their dominant positions in the market.

The model depicted in Figure 8-1 is modified to reflect the changes made by implementing the above 3 steps. As shown in Figure 8-3, in the new model<sup>66</sup>, the regulatory barriers between different sectors are removed. Television and telecommunications carriers are allowed to enter each other's market. The primary responsibility of the newly created super agency is to ensure fair interconnection and prevent the abuse of market power. Companies providing content service are regulated separately. Whether the content layer is regulated by the Party directly or by some other government ministries, it will remain under close control in the short term. It is worth noting that the SASAC is missing from the proposed model. Ideally, the ownership structure of these state-owned enterprises shall be diversified to such an extent that the state no longer has the dominant share. Under this scenario, the SASAC will no longer be able to manipulate the market directly.

---

<sup>66</sup> Value-added services providers are regulated according to the nature of the service rendered. If the service does not involve content, such as broadband access service, it should be regulated at the conduit layer. Services involved with content, such as Internet search engine service, should be regulated at the content level.

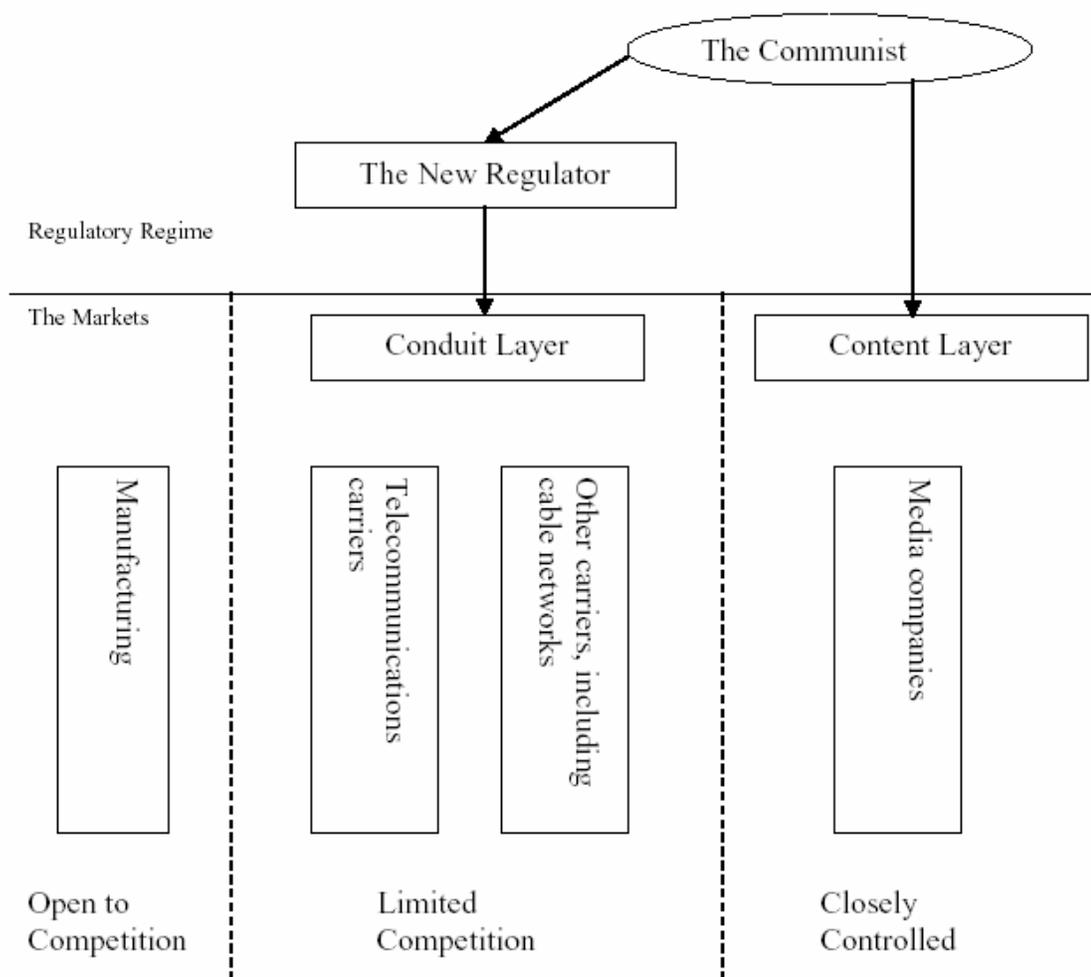


Figure 8-3: A Proposed Model for China's Telecommunications

#### 8.4 Concluding Remarks

This chapter summarizes the cases studied and proposes a step-by-step policy recommendation for further reform. China's telecommunications market and regulatory regime appear to be complicated. However, essentially, it is a compromise among interested parties. The combination of the "silo" type of regulation, the conflict of

national and local interests and the dominance of state ownership are the key “Chinese characteristics”. The objectives of China’s telecommunications policy are also identified. Expanding telecommunications to lead the growth of the national economy and strengthening domestic carriers in the face of global competition are two primary goals. The proposed model aims to resolve issues identified in line with the Chinese government’s long term policy objectives.

This chapter summarizes the cases studied and proposes a step-by-step policy recommendation for further reform. China’s telecommunications market and regulatory regime appear to be complicated. However, essentially, it is a compromise among interested parties. The combination of the “silo” type of regulation, the conflict of national and local interests and the dominance of state ownership are the key “Chinese characteristics”. The objectives of China’s telecommunications policy are also identified. Expanding telecommunications to lead the growth of the national economy and strengthening domestic carriers in the face of global competition are two primary goals. The proposed model aims to resolve issues identified in line with the Chinese government’s long term policy objectives.

## Chapter 9

### CONCLUSIONS

#### 9.1 An Overview

Having reviewed the different aspects of China's telecommunications regulatory regime and its impact on, as well as its interaction with, the regulated telecommunications service industry, in this last chapter, an attempt will be made to summarize the so-called "telecommunications with Chinese characteristics". In addition, some predictions about the shape of the future will be offered.

Scholars have studied China's telecommunications market from different perspectives. However, there seems to be a lack of consistency. The discrepancy is partly attributed to the fast-changing social, economic and political conditions in China. Any policy is a result of the compromise among interested parties, whether in capitalist or socialist systems. However, policy making in Western countries is often accompanied by public debates, while China lacks such a transparent system. Although China is making some progress in gradually allowing public participation in the policy discourse, much of its decisions are still made under the table. The unpredictability and uncertainty of China's policy environment makes it difficult, if not impossible, for scholars to build a complete theoretical framework. In addition, previous research fails to recognize the special management structure of the Chinese carriers, which is essential to understanding the market behavior of these state-owned enterprises. Moreover, previous research also

fails to distinguish measures from objectives. Many western-minded scholars fail to recognize that these commonly-referred policy goals, such as a competitive market structure, network neutrality, independent regulator, etc., are only the measures, not the goals, of China's telecommunications policy. As a result of the confusion, much of the previous policy analysis attend to trifles and neglects the essentials.

The primary contribution of this research is the identification of the objectives of China's telecommunications policy: namely expanding telecommunications to serve the public interest and strengthening domestic carriers in the face of global competition. As reiterated in previous chapters, the quasi-autocratic political regime enables the Chinese government to concentrate limited resources on its preferred sectors. The consistent support from the government has helped China's telecommunications industry successfully leapfrog to a relatively modern stage and potentially take the lead in some areas in the future. In the short term, the Chinese government is unlikely to make fundamental changes to its telecommunications policy at the macro level. However, some micro policy adjustments are likely to occur. The ability of the current model of regulation to secure long term sustainability is questionable. Problems have already surfaced. In order to make sound policy recommendations, it is crucial to understand the perplexing so-called "Chinese characteristics" of the market and regulatory regime, which is another important contribution of this research. The preliminary conclusion is that the combination of the "silo" type of regulation, the conflict of national and local interests and the dominance of state ownership are the key "Chinese characteristics". However, it should be noted that "Chinese characteristic" is an evolving concept. Any policy measures that are in accord with the objectives of the Chinese government can be

branded as “Chinese characteristics”. In brief, the telecommunications industry is like the flagship of the Chinese economy. While adjustments are continuously made, it is sailing steadily to its destination.

## **9.2 The Shapes of the Future**

As the concluding part of this thesis, a picture will be drawn based on the model proposed in Chapter 8. What the market should look like in the next decade or two will be discussed. In each subsection, the main obstacles, if applicable, will also be mentioned.

### **9.2.1 Ownership**

The entry barrier to value-added services is already very low in China. For example, as of 2004, private capital accounted for 69.81 percent of all investments in cellular value-added services, leaving the state capital’s share at only 5.14 percent (“Review of China’s cellular value-added service in 2005”, 2005). Even in basic services, although all the major Chinese telecommunications carriers are state-owned, they have been injected with many “market” ingredients. Regarding foreign direct investment, beginning in 2004, China allowed foreign investors to set up joint ventures in basic telecommunication services. Initially, the share of foreign capital was set at a 25 percent cap and their operations were limited to three major cities: Beijing, Shanghai and Guangzhou. The allowance will gradually rise to 49 percent by 2007 and the area restriction will be eliminated.

However, for the near future, there is no sign that the Chinese government will privatize state-owned carriers. According to Deng's theory, no matter how much foreign or private capital there is, as long as state ownership is dominant, China does not deviate from the socialist road. The ultimate goal of China's reform is to enhance state sectors by introducing competition and advanced technological and managerial techniques. As long as China sticks to Deng's guideline, privatization, especially in basic telecommunications, is not really a possibility. However, the Chinese government will continue to inject more "market" ingredients into telecommunications.

### **9.2.2 Independent Regulator**

A complete independent regulator is not really a possibility in China at this time. In fact, there is no completely independent regulator in any country. Even in the U.S., the FCC is constrained by other institutions. In addition, socialism with Chinese characteristics emphasizes a socialist political regime, in which the Party is the center of state power. If a regulatory agency were truly independent, the Party would have less control over it, which is certainly undesirable to the Party. However, it appears that there is a common misunderstanding regarding "independent regulator" in China's policy circles. An independent regulator is by no means a politically independent body. The WTO defines an "independent regulator" as a regulatory agency that is separate from, and not accountable to, any supplier of basic telecommunications services, which is what exactly the MII is defined and supposed to act. The real issue is how to ensure that the decisions of and the procedures used by regulators are impartial with respect to all market

participants, including private capital. To that end, diversifying the dominant state ownership in basic telecommunications and the establishment of a formal telecommunications law are more important than adjusting the appearance of the regulatory regime. As aptly pointed out by Taylor and Zhang, if that (addressing the concerns of foreign investors) can be done, the formal structure matters much less, otherwise, the formal structure doesn't matter at all (2005).

### **9.2.3 Regulatory Theory**

With the convergence of new communications technologies, the current “silo” approach in telecommunications regulations seems to be outdated, for example, in the case of IPTV (C. Liu & Taylor, 2005). One solution is to adopt the so-called layered model, which substitutes for the service-specific approach of the current model an approach based on the technical nature of the underlying, multi-purpose networks used to provide those services. In the short term, evidence has shown that current communications technologies will likely be unified under the umbrella of Internet Protocol (IP). Thus, the layered model should fit well. Compared to other alternatives, the layered model is promising partly because its engineering approach is more acceptable to the MII's staff, who mostly have engineering training. However, as discussed in Chapter 8. China is likely to adopt a simplified layered model in which conduit and content are regulated separately.

#### **9.2.4 Regulatory Agencies**

There is a strong call for the convergence of the MII and the SARFT in order to facilitate cross-entry of telecommunications and cable carriers. However, we must keep in mind that the most important function of the SARFT is censoring media content. While telecommunications is highly content-neutral, television industries are considered ideology-sensitive. The Party's powerful propaganda department fears that the opening up of media-rich sectors, such as TV, radio, newspaper, etc., could eventually weaken its established propaganda machine that has been an effective tool of social control for decades. Thus, it is unlikely that those two agencies will merge in the near future. However, it might be possible that the censorship function of the SARFT might be transferred to another government agency so that the remaining less ideology-sensitive functions of the SARFT could be put under the same roof of the telecommunications regulator.

#### **9.2.5 Regulatory Process**

Policy making in China is ambiguous, if not mysterious. Generally speaking, telecommunications policy making in the past has all been carried out in a top-down fashion. However, there is no easy way to find out who the decision maker is. Telecommunications carriers are among the few profitable state-owned enterprises and have long been regarded as the key driving force for the national economy. That being said, the SASAC, as the representative of the State to oversee the "state asset", plays the essential role of keeping this industry on the right track. Acknowledging that, there is

actually not much room left for the MII. It is questionable whether the MII has real power on some of the key issues, such as licensing, antitrust investigation, pricing, etc. In that regard, the MII works more like a patch-maker in many situations.

Generally speaking, China's regulators, including the SASAC, MII and NDRC, lack expertise in regulating the modern quasi-commercialized state enterprises. Thus, they usually take a wait-and-see attitude, which we call "feeling stones while crossing a river"<sup>67</sup> approach in regulating the fast changing market. If it is difficult to judge whether something is right, the government will let it develop to some extent, and then draw conclusions. The policy-making process based on this regulatory philosophy can then be divided into two stages: observation and decision-making. In telecommunications regulation particularly, the MII is the major agency in the observation stage when small patchworks are continuously made to adjust the market. At the decision-making stage, although it is still not easy to identify the final decision maker, clearly enough, the SASAC plays the crucial role because all the relevant policies and regulations meet the basic criterion, preserving and increasing the value of state-owned assets. The Chinese government is most likely to continue this style of regulation in the near future. However, in the long term, one would expect a more open regulatory process, at least procedure-wise.

---

<sup>67</sup> "Feeling stones while crossing a river" is an old Chinese saying meaning thinking carefully, checking thoroughly before acting. Deng often quoted this saying to encourage people to regard China's economic reform as an experiment and try boldly before reaching the conclusion.

### **9.2.6 Competitive Market Structure**

On the surface, China's telecommunications competition looks exciting. In both the landline and cellular markets, there are at least two competitors now. There is no textbook "free competition" in telecommunications in any country, particularly in basic services. In China, since the major carriers are state-owned, managed competition might be the best result the Chinese government could possibly achieve at this time. Even in the current managed competition, the dynamics between government (public) ownership and the self-interest of quasi-commercialized carriers already results in irrational competition. However, in value-added services, free competition with minimal regulations is expected. With an eye to potential foreign and domestic private investments in basic telecommunications, as long as private ownership does not prevail, the Chinese government should welcome the competition they might bring. However, the introduction of private investments shakes the foundation of the government-controlled managed competition in the long term, particularly with an eye to the possible diversifying of the state ownership in basic telecommunications. A competitive market structure requires a level playing field for all the players. The state capital is unlikely to retreat completely from the telecommunications sector. At issue is to what extent the Chinese government wants to participate in this industry, as a share holder or a controller. The question comes back to the more general issue of what direction state ownership reform should head for, which is framed by some as the choice between socialist or capitalist roads. Despite the ideological debate, as long as the Chinese government has the power to intervening the market behavior of telecommunications carriers directly, a truly competitive market

structure is not likely to occur. However, lack of a truly competitive market structure does not mean the market is not competitive, nor is there no opportunity for foreign investors. Experiences from telecommunications manufacturing have shown that foreign companies can succeed in China under the institutional constraints. For multinational carriers interested in the Chinese market, finding the strategy that fits China's political, economic and social characteristics is probably more crucial than hoping that the Chinese government to adopt the rules that they are familiar with in their home countries.

### **9.2.7 Legislation**

The State Council issued the Telecommunications Regulations of the People's Republic of China (the Telecom Regulations) on September 20, 2000. The Telecom Regulations represented the first effort by a national rulemaking body to standardize the administration of China's rapidly changing telecommunications industry (Jamie, 2001). It was once reported that China was close to completing a draft of its first Telecommunications Law, which could be submitted to the State Council, or cabinet and go to the national legislature for passage as early as 2005<sup>68</sup> (Chen, 2004). However, apparently, the legislation is postponed again. As of spring 2006, China does not have a formal telecommunications law.

It should not be expected that China will draft a law which is a replica of the U.S. Telecommunications Act of 1996, from which China will certainly borrow many

---

<sup>68</sup> At the time this dissertation is written, telecommunications law is still under discussion.

principles. As Wu Jichuan, the past Minister of the MII, pointed out, China should formulate telecommunication laws and regulations as well as regulatory policies in line with national conditions and international practices, a reflection of Deng's socialism with Chinese characteristics in telecommunications ("Telecom industry needs supervision, information minister says", 2002).

### **9.2.8 Public Interest**

The idea of consumer interest will not prevail in China. Traditionally, Chinese culture put its emphasis on national, collective and family interests instead of individual interests. The market is regarded as a means to enhance the nation's overall strength. Although liberalism/individualism has been gradually introduced in China in the past century, in the short term, it can hardly be a serious challenge to the Chinese people's mainstream philosophical thinking. A government directed, regulation-based public interest will continue to be the foundation of China's telecommunications regulations. As detailed in Chapter 8, in telecommunications particularly, the public interest is expanding the telecommunications network to as many as people possible.

### **9.2.9 Universal Service**

Although China has made great progress in the past 20 years, unfortunately, disparities between rural and urban areas have, in fact, broadened. The Chinese government has recognized the negative impact of rural/urban gaps on social harmony

and China's long-term development. After President Hu and Premier Wen took office, the Party launched a national campaign to boost the development of rural areas. In telecommunications particularly, while scholars have identified gaps in gender, occupation, income, etc., rural/urban disparity has attracted the most intensive public attentions in China.

In line with the Party's ambition to build a harmonious society, the MII declared a project called "Telephone Service in Each Village Project" in 2004. The MII planned to connect 95 percent of all administrative villages by the end of 2005. Since there is no explicit universal service funding mechanism, the MII distributed the task among the big six state-owned carriers based on their revenue and the geographical location of their networks.

The current model of universal service is tentative. Having enjoyed preferential policies for nearly a decade, it is time for China's telecommunications carriers to pay back to the society. In the short term, the Chinese government should continue to promote rural development projects such as the "Telephone Service in Each Village Project". However, in the long term, a market-oriented universal service mechanism should be set up to ensure the sustainability of universal service with an eye to the future development of the telecommunications industry.

#### **9.2.10 Internet Regulation**

The Internet is rapidly growing in China. In most cities, broadband access is available at a price within the reach of working families. To the Chinese government, the

Internet is double-edged. On the one hand, the Internet can improve productivity and accelerate the “informatization” of the country. On the other hand, the decentralized nature of the Internet makes it difficult to control. The Chinese government has been continuously issuing regulations regarding the Internet. A censorship system called Golden Shield is implemented nationwide.

Many western scholars had predicted that the Internet would bring the collapse of the Party which proved unfounded. The Chinese government’s effort to build a “Great Firewall on the Net” is also doomed to fail because any firewall, no matter how advanced it might be, is easy to circumvent and generally ineffective at preventing external news from entering the country. The Chinese government should find a balance between a hands-off approach and detailed regulation. The key is to incorporate the use of the Internet for its own purposes. The government should realize that the effects of blocking certain websites are very trivial. Filtering raises more curiosity. Detailed regulation does more harm than good. As long as China’s economy is on the right track, there is nothing to fear about the Internet.

### **9.2.11 Interconnection**

Economists generally agree that a freely negotiated contract between interconnecting parties should accurately reflect the true cost of interconnection, in which case, no regulation is needed. However, in the real world, a freely negotiated agreement may be difficult to reach because of significant differences in market power. Regulatory policy is needed to secure the smooth functioning of the market, prevent abuse of

monopolistic power and encourage competition. Economic efficiency is not the only concern for regulators when making interconnection policy. Political goals are also often taken into account.

The MII issued the "Administration of the Interconnection of Public Telecommunications Networks Provisions" on May 10, 2001. It sets out four principles of interconnection: technical feasibility, economical rationality, fairness, and mutual cooperation. However, the Interconnection Regulations provide little guidance for determining the level of interconnection fees. Article 22 states that interconnection settlement rates should be determined on a cost basis, without mentioning what methodology should be used for calculating the cost base. However, interconnection, despite whatever pricing methodology the Chinese government selects, must be mandatory. The pricing method should favor new competitive carriers in the short term. Once a competitive market is functioning, interconnection policy should be adjusted accordingly. However, the first step for the Chinese government is to conduct a thorough cost study of those state-owned carriers as soon as possible.

### **9.3 Summary**

There is no question about the benefits that China's telecommunications reform has brought to the national economy and the society. As of January 2006, China had 353 million wireline and 399 million wireless subscribers, ranking first in the world. Although problems, such as regional disparity, exist, urban Chinese people are now enjoying the world's best communications technologies. Western scholars are sometimes

puzzled by China's great success in telecommunications because none of the prerequisites, articulated in classical economics textbooks, for the successful transition from a socialist economy to a market economy, are met in China. What they have ignored are "Chinese characteristics".

The utmost objective of socialism with Chinese characteristics is to emancipate productivity. Thus, competition is encouraged as long as it has positive impacts. If the divestiture of China Telecom could effectively introduce competition, the Chinese government did not hesitate to break up China Telecom. As we have observed, what the Chinese government is trying to achieve is a competitive industrial structure and it has accomplished its goal tentatively. Socialism with Chinese characteristics also upholds the dominant control of the state sector and the Party's leadership. Thus, a neoclassical free market economy is not where reform is heading. Ironically, it is the dominance of state ownership that has enabled the Chinese government to implement its plan efficiently<sup>69</sup>. In addition, it is the autocratic party system that ensures the stability of government restructuring. As the past Vice Minister of the MII, Chunjiang Zhang, stated at the 2002 World Telecommunication Development Conference (WTDC):

The underlying cause (for our success) is that we have blazed out a road with Chinese characteristics based on our actual conditions and the philosophy of "the development goes as the top priority". During the past more than 20 years, the Government has given priority and support to the telecom infrastructure construction as the cornerstone of the whole

---

<sup>69</sup>The break-up of China Telecom took a little less than half a year, while the break-up of AT&T took at least 5 years because of the lengthy lawsuits.

economy, leading to the creation of an environment where the entire society is favorable to the telecom industry.<sup>70</sup>

Given such a short time, I can not draw a complete picture of the future of China's telecommunications. Deng's 1992 speech probably best describes the making of China's telecommunications and offers the best predictions for the future to come. Deng said:

Don't argue; try bold experiments and blaze new trails<sup>71</sup>

We shall push ahead along the road to Chinese-style socialism. Capitalism has been developing for several hundred years. How long have we been building socialism? Besides, we wasted twenty years. If we can make China a moderately developed country within a hundred years from the founding of the People's Republic, that will be an extraordinary achievement. The period from now to the middle of the next century will be crucial. We must immerse ourselves in hard work: we have difficult tasks to accomplish and bear a heavy responsibility.<sup>72</sup>

---

<sup>70</sup> Excerpt from Statement of Vice Minister of Information Industry at the Digital Divide Special Session, available at [http://www.itu.int/newsarchive/wtdc2002/digitaldivide\\_china.htm](http://www.itu.int/newsarchive/wtdc2002/digitaldivide_china.htm), accessed on 11/1/2005.

<sup>71</sup> Excerpts from talks given in Wuchang, Shenzhen, Zhuhai and Shanghai, available at <http://english.peopledaily.com.cn/dengxp/vol3/text/d1200.html>, accessed on 11/1/2005.

<sup>72</sup> *Ibid.*

## Bibliography

- 3ginsight.com. (2001). Siemens strengthens its worldwide position by further development in TDD radio technology. Retrieved March 15, 2003, from the World Wide Web: [http://www.3ginsight.com/siemens\\_TDSCMA.htm](http://www.3ginsight.com/siemens_TDSCMA.htm)
- 3gnewsroom.com. (2002). Datang and Qualcomm talk over patent issue. Retrieved March 2003, 2003, from the World Wide Web: [http://www.3gnewsroom.com/3g\\_news/nov\\_02/news\\_2716.shtml](http://www.3gnewsroom.com/3g_news/nov_02/news_2716.shtml)
- 18 Chinese cities to test run IPTV business. (2005). *SinoCast China Business Daily News*, p. 1.
- Ahn, J. H., Kyoung, C. C., Duk, B. J., & Myoung, H. P. (2004). Bridging telecommunications service: Its concept and related management strategy. *Telecommunications Policy*, 28(9-10), 733-750.
- Alcatel Shanghai bell, SMG launched IPTV lab. (2005). *SinoCast China Business Daily News*, p. 1.
- Andrew, B. (2004). China hits snag in goal for digital-tv standard. *Wall Street Journal*, p. B.4.
- Asia: Hu's in charge; China. (2005). *The Economist*, 376(8440), 46.
- Baark, E. (1997). *Lightning wires: The telegraph and China's technological modernization, 1860-1890*. Westport, CT: Greenwood Press.
- Bates, R. (1995). Social dilemmas and rational individuals: An assessment of the new institutionalism. In J. Harriss, J. Hunter & C. M. Lewis (Eds.), *The new institutional economics and third world development*. New York: Routledge.
- Baumol, W. J., & Merrill, T. W. (1997). Deregulatory takings, breach of the regulatory contract, and the telecommunications act of 1996. *New York University Law Review*, 72(5), 1037-1067.
- Bcc: PHS business to be launched in Beijing on may 17. (2003). *SinoCast China Business Daily News*, p. 1.
- Benkler, Y. (2000). Viacom-cbs merger: From consumers to users: Shifting the deeper structures of regulation toward sustainable commons and user access. *Federal Communications Law Journal*, 52, 561-579.

- Browning, E., & Browning, J. (1989). *Microeconomic theory and applications* (3rd ed.). Glenview, Ill.: Scott, Foresman and Co.
- Buckman, R. (2004). China's crowded cellphone market faces more hurdles, study shows. *Wall Street Journal*, p. 1.
- Cannon, R. (2003). The legacy of the federal communications commission's computer inquiries. *Federal Communications Law Journal*, 55, 167-205.
- Cannon, R. (2005). State regulatory approaches to voip: Policy, implementation, and outcome. *Federal Communications Law Journal*, 57, 479-510.
- Cao, T. (2003). "Xiaolingtong has a long way to go": An interview with the father of PHS 访中国小灵通之父徐福新：“小灵通”路漫漫 *E-Time Weekly e 时代周报*
- CCTV bets big on IPTV business. (2005). *SinoCast China Business Daily News*, p. 1.
- CDB falls into trouble in making loans to cable tv industry. (2005). *SinoCast China Business Daily News*, p. 1.
- Changzhen, O. (2005, August 17). CEO reposition China mobile: The elephant is still running fast 中国移动王建宙重新定位：大象还在继续快跑. *21 世纪经济导报 21 Century Economics*.
- Chen, K. (2004). China crafts telecom law to level playing field. *Wall Street Journal*, p. C.5.
- Chen, Y. (1990). Telecommunications, the nerve infrastructure of national economic development. *China Telecommunications Construction (中国电信建设)*, 2(3), 4-11.
- Chen, Y. (1993). Driving forces behind China explosive telecommunications growth. *IEEE communications magazine*, 31(7), 20-22.
- China accelerates popularizing Digital TV sets. (2004). *SinoCast China Business Daily News*, p. 1.
- China IPTV: Another view (2005, 8/31). *Inside Digital TV* Retrieved 18, 8
- China railcom orders PAS system from UTStarcom. (2003). *World IT Report*, 1.
- China telecom and China netcom to scabble for 3G market. (2005). *SinoCast China Business Daily News*, p. 1.

- China to be world's largest IPTV subscriber market by 2010. (2005). *SinoCast China Business Daily News*, p. 1.
- Cieslik, A., & Kaniewska, M. (2004). Telecommunications infrastructure and regional economic development: The case of Poland. *Regional studies*, 38(7).
- Communications Industry Newspaper. (2003). *Yearbook of China communications 中国通信年鉴 2003*. Beijing: People's Posts and Telecommunications.
- Cronin, F. (1993). Telecommunications infrastructure investment and economic development. *Telecommunications policy*, 17(6), 415-430.
- Dai, X. D. (2002). Towards a digital economy with Chinese characteristics? *New Media & Society*, 4(2), 141-162.
- David, P., & Shane Greenstein. (1990). The economics of compatibility standards: An introduction to recent research. *Economics of Innovation and New Technology*, 1(1), 3-41.
- Development of IPTV not mature, oriental cable network. (2005). *SinoCast China Business Daily News*, p. 1.
- Digital TV ground transmission standard to debut. (2005). *SinoCast China Business Daily News*, p. 1.
- Digital TV meets cold reception in China. (2005). *SinoCast China Business Daily News*, p. 1.
- Dordick, H. (1989). Telecommunications deregulation in New Zealand: Testing the limits of non-regulation. *Columbia Journal of World Business*, 24(1), 17-30.
- Dyer, G., & Wilkins, A. (1991). Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt; better stories and better constructs: The case for rigor and comparative logic. *Academy of Management. The Academy of Management Review*, 16(3), 613.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management. The Academy of Management Review*, 14(4), 532.
- Farrell, J., & Saloner, G. (1985). Standardization, compatibility, and innovation. *The Rand Journal of Economics*, 16(1), 70.
- Farrell, J., & Saloner, G. (1988). Coordination through committees and markets. *The Rand Journal of Economics*, 19(2), 235.

- Fowler, M., & Brenner, D. (1982). A marketplace approach to broadcast regulation. *Texas Law Review*, 60, 207-257.
- Frieden, R. (2003). Adjusting the horizontal and vertical in telecommunications regulation: A comparison of the traditional and a new layered approach. *Federal Communications Law Journal*, 55, 207-250.
- Frieden, R. (2004). The fcc's name game: How shifting regulatory classifications affect competition. *Berkeley Technology Law Journal*, 19, 1275-1314.
- Funk, J. L., & Methe, D. T. (2001). Market- and committee-based mechanisms in the creation and diffusion of global industry standards: The case of mobile communication. *Research Policy*, 30(4), 589-610.
- Goro, O., & Sylvia, M. C.-O. (2005). The development of cable television in east asian countries. *Gazette*, 67(3), 211.
- Grindley, P. (1995). *Standards, strategy, and policy : Cases and stories*. Oxford [England] ; New York: Oxford University Press.
- GSM Association. (2004, March 10). Taiwan on global track to 3G success. Retrieved March 10, 2006, from [http://www.gsmworld.com/news/press\\_2004/press04\\_18.shtml](http://www.gsmworld.com/news/press_2004/press04_18.shtml)
- Guo, Z. (2003). Chinese media after china's entry into WTO. *Javnost—The Public*, 10(4).
- Hackler, D. (2003). Invisible infrastructure and the city: The role of telecommunications in economic development. *The American behavioral scientist*, 46(8), 1034-1055.
- Harwit, E. E. (1998). China's telecommunications industry: Development patterns and policies. *Pacific affairs*, 71(2), 175.
- Haucap, J., & Marcus, J. S. (2005). Why regulate? Lessons from new zealand. *Communications Magazine, IEEE*, 43(11), 14-16.
- Hawkins, R., Mansell, R., & Skea, J. (1995). *Standards, innovation and competitiveness : The politics and economics of standards in natural and technical environments*. Cheltenham [England] ; Brookfield, Vt.: Edward Elgar.
- Henderson, A., Gentle, I., & Ball, E. (2005). WTO principles and telecommunications in developing nations: Challenges and consequences of accession. *Telecommunications Policy*, 29(2-3), 205-221.

- Hoewing, C. C. (1999). Moving to competition: New zealand's innovative regulatory model for the telecommunications marketplace. *IEEE Communications Magazine*, 37(10), 110-113.
- Hong, J. (1998). *The internationalization of television in China : The evolution of ideology, society, and media since the reform*. Westport, Conn.: Praeger.
- Horwitz, R. B. (1989). *The irony of regulatory reform : The deregulation of american telecommunications*. New York: Oxford University Press.
- Hu, A. (2005, January 16). 3G China: A century report 中国 3g 世纪报告. *21st Century Economic Report 21 世纪经济报道*.
- Hu, h. (2001, July 11). Some issues regarding China's telecommunications reform 关于中国电信改革的几个问题. *Hua Xia Timely 华夏时报*.
- Huang, J. (2005, January 25). Is the MII captured?: An interview with kan kaili. *Economics News Daily 每日经济新闻*.
- Ishii, K. (1996). PHS: Revolutionizing personal communication in Japan. *Telecommunications Policy*, 20(7), 497-506.
- Jamie, P. H. (2001). China's new telecommunications regulations and the WTO. *The China Business Review*, 28(4), 34.
- Jia, H. (2004). The three represents campaign: Reform the party or indoctrinate the capitalists? *Cato Journal*, 24(3), 261.
- Jiang, j. (2005, February 15). The era of network tv is coming, traditional media wants to test water 网络电视时代即将到来 传统媒体计划涉足. *China Business Weekly 中国商业周刊*.
- Jin, C. (2006). Carriers are captured by interest groups: An online interview with li jinliang 李进良指利益集团俘获运营商
- Kan, K. (2003). The wrong position of the government in telecommunications reform 政府在电信改革中的职能定位不准. *News Weekly 新闻周刊*.
- Keil, T. (2002). De-facto standardization through alliances--lessons from bluetooth. *Telecommunications Policy*, 26(3-4), 205-213.
- Koelble, T. (1995). The new institutionalism in political science and sociology. *Comparative Politics*, 27, 231-243.

- Kraemer, K. K. (1995). From nationalism to pragmatism: It policy in China. *Computer*, 28(8), 64-73.
- Lehenkari, J., & Miettinen, R. (2002). Standardisation in the construction of a large technological system--the case of the nordic mobile telephone system. *Telecommunications Policy*, 26(3-4), 109-127.
- Lemley, M. A., & Lessig, L. (2001). The end of end-to-end: Preserving the architecture of the internet in the broadband era. *University of California Los Angeles Law Review*, 48, 925-972.
- Lerner, N. C. (1987). Who's in control? Managing China's complex telecom industry (part 1). *Telephony*, 213(8), 32.
- Leslie, P. N. (2005). Ntt docomo-no longer a wrong number? *Barron's*, 85(10), MW12.
- Levy, B., & Spiller, P. (Eds.). (1996). *Regulations, institutions, and commitment: Comparative studies of telecommunications*: Cambridge University Press.
- Li, A. (2003, March 10). Minister wu explains policy regarding "Xiaolingtong" 吴基传再解释“小灵通”政策：不鼓励也不干涉. *China manufacturing and commerce timely 中华工商时报*.
- Li, B. (2003, February 26). North-south divestiture will have no effect, says kan kaili 阚凯力：电信“南北拆分”毫无成效. *Economics and Finance Timely 财经时报*.
- Li, Y., Lei, Z., & Xu, S. (2001, May 30). Rethinking China's telecommunications reform 对中国电信业改革的思考 *Tongxin Xinxi Bao*.
- Li, Z. (1995). Some thoughts on the development of China's cellular industry 我国蜂窝移动通信发展的思考. *Communications Products World 通讯产品世界*, 12(4), 9-12.
- Liao, Q. (2004, August 5). China netcom restrcuture corporate structure 网通上市前夜机构调整 初现一级法人制雏形. *Beijing Entertainment Information 北京娱乐信报*.
- Lieberthal, K. (1992). Introduction: The fragmented authoritarianism model and its limitation. In K. Lieberthal & D. Lampton (Eds.), *Bureaucracy, politics, and decision making in post-mao China*. Berkeley: University of California Press.
- Lin, J., Liang, X., & Wan, Y. (2001). *Telecommunications in China : Development and prospects*. Huntington, N.Y.: Nova Science Publishers.

- Liu, C., & Taylor, R. (2005). *IPTV: A comparative study of the united states and China*. Paper presented at the Innovation and Media: Managing Changes in Technology, Products, and Processes, Stockholm, Sweden.
- Liu, P. (2005, 9/13/2005). Netcom cross line, IPTV awaits change 网通“越界” iptv 岁末变局. *China CBINEWS 电脑商情报*.
- Liu, T. (1988). *Transportation and communication in national economy*. Chongqin: Chongqin Publishing House.
- Liu, Y.-l. (1994). The growth of cable television in China: Tensions between local and central government. *Telecommunications Policy*, 18(3), 216-228.
- Lojkine, S. M. (1992). The new zealand experience. *Telecommunications Policy*, 16(9), 768.
- Lu, D. (1994). The management of China's telecommunications industry: Some institutional facts. *Telecommunications Policy*, 18(3), 195-205.
- Lu, D., & Wong, C. K. (2003). *China's telecommunications market: Entering a new competitive age*. Cheltenham, UK ; Northampton, MA: Edward Elgar.
- Lu, W. (2005). Problems and solutions of China's telecommunications carriers 中国电信公司治理面临的问题与解决途径. *邮电经济管理 P&T Enterprise Management*(7).
- Mackerras, C., Taneja, P., & Young, G. (1998). *China since 1978 : Reform, modernisation and 'socialism with Chinese characteristics'* (2 ed.). Melbourne: Addison Wesley Longman.
- Marcus, S. (2003). The potential relevance to the united states of the european union's newly adopted regulatory framework for telecommunications *Journal on Telecommunications & High Technology Law*, 111-139.
- May, R. J. (2006). Why stovepipe regulation no longer works: An essay on the need for a new market-oriented communications policy. *Federal Communications Law Journal*, 58(1), 103.
- McChesney, R. W. (1997). *Corporate media and the threat to democracy*. New York: Seven Stories Press.
- McChesney, R. W. (1999). *Rich media, poor democracy: Communication politics in dubious times*. Urbana: University of Illinois Press.

- McTaggart, C. (2003). A layered approach to internet legal analysis. *McGill Law Journal*, 571-625.
- Melinda, L. (2006). China 2.0: After 25 years of sizzling growth, beijing's shifting to a new economic model. Can big red go green? *Newsweek*.
- MII puts brake on WCDMA trial network construction. (2006). *SinoCast China Business Daily News*, p. 1.
- Ministry of Information Industry. (2002). *2001 statistical report of China's telecommunications 2001 年通信发展统计公报* Retrieved 2006 March 12. from [http://www.mii.gov.cn/art/2005/12/16/art\\_169\\_1477.html](http://www.mii.gov.cn/art/2005/12/16/art_169_1477.html).
- Ministry of Information Industry. (2004). *China's communications yearbook 2003*. Beijing: Posts&Telecom Press.
- Ministry of Information Industry. (2001). *2000 statistical report of china's telecommunications 2000 年通信发展统计公报* Retrieved 2006 March 12. from [http://www.mii.gov.cn/art/2005/12/16/art\\_169\\_1489.html](http://www.mii.gov.cn/art/2005/12/16/art_169_1489.html).
- Ministry of Information Industry. (2002). *2001 statistical report of china's telecommunications 2001 年通信发展统计公报* Retrieved 2006 March 12. from [http://www.mii.gov.cn/art/2005/12/16/art\\_169\\_1477.html](http://www.mii.gov.cn/art/2005/12/16/art_169_1477.html).
- Ministry of Information Industry. (2003). *2002 statistical report of china's telecommunications 2002 年通信发展统计公报* Retrieved 2006 March 12. from [http://www.mii.gov.cn/art/2005/12/16/art\\_169\\_1473.html](http://www.mii.gov.cn/art/2005/12/16/art_169_1473.html).
- Mueller, M. (1996). *Universal service: Competition, interconnection, and monopoly in the making of the american telephone system*. Cambridge, MA: MIT Press.
- Mueller, M., & Tan, Z. (1997). *China in the information age : Telecommunications and the dilemmas of reform*. Westport, Conn.: Praeger.
- National Bureau of Statistics of China. (1999). *New China's 50 years (新中国 50 年系列分析报告)* . Retrieved 2006/3/1. from [http://www.stats.gov.cn/tjfx/zgfx/xzgwsnxlfxbg/t20020605\\_21428.htm](http://www.stats.gov.cn/tjfx/zgfx/xzgwsnxlfxbg/t20020605_21428.htm).
- Netcom cancels PHS plan in Beijing. (2002). *Asiainfo Daily China News*, p. 1.
- New Millennium Research Council. (2004). *Free ride: Deficiencies of the mci 'layers' policy model and the need for principles that encourage competition in the new ip world*. Washington, D.C.

- Nin, H. (2002, June 3). Today's "Xiaolingtong" Is no longer the same as that of the past 今非昔比“小灵通”. *Guangming Daily 光明日报*.
- Nin, H. (2004, December 23). Vice minister of the MII says the government will expedite the 3G policy making process 信息产业部副部长奚国华:政府将加快 3g 决策. *Guangming Daily 光明日报*.
- North, D. (1990). *Institutions, institutional change, and economic performance*. Cambridge ; New York: Cambridge University Press.
- North, D. (1991). Institutions. *The Journal Of Economic Perspectives*, 5(1), 97-112.
- Number of China's IPTV subscribers expected to reach 1.17mn. (2005). *SinoCast China Business Daily News*, p. 1.
- Ouyang, K. (2001). Contemporary development of marxist philosophy in China. *Socialism and Democracy*, 15(2), 85.
- Parker, E. (1984). Appropriate telecommunications for economic-development. *Telecommunications Policy*, 8(3), 173-177.
- Potter, W. J., Cooper, R., & Dupagne, M. (1993). The three paradigms of mass media research in mainstream communication journals. *Communication Theory*, 3(4), 317.
- Rebecca, B. (2005). In China, curbs imperil internet tv; tight grip on programming may limit appeal of services being tested by phone firms. *Wall Street Journal*, p. B.4.
- Review of China's cellular value-added service in 2005. (2005). *Communications World*.
- Roller, L. (2001). Telecommunications infrastructure and economic development: A simultaneous. *The American Economic Review*, 91(4), 909-923.
- Rossi, J. (1998). Deregulatory takings and the regulatory contract: The competitive transformation of network industries in the united states. *Texas Law Review*, 77(1), 297-320.
- SARFT delivers free stb to create Digital TV market. (2005). *SinoCast China Business Daily News*, p. 1.
- SARFT intends to control China's catv networks. (2005). *SinoCast China Business Daily News*, p. 1.
- SARFT takes actions on illegal IPTV vendors. (2005). *SinoCast China Business Daily News*, p. 1.

- Saunders, M. M. (1994). Telecommunications regulation in new zealand. *Telecommunications policy*, 18(6), 495-496.
- Shanda set up first IPTV content alliance. (2005). *SinoCast China Business Daily News*, p. 1.
- Shanghai telecom to develop new users of PHS. (2004). *SinoCast China Business Daily News*, p. 1.
- Shi, W. (2002). Market evolution of telecom service industry in China 中国电信业的市场化演进. *World Telecommunications 世界电信*(8).
- Shoesmith, B., & Wang, H. (2002). Networks and industrial community television in China. In S. Donald, M. Keane & Y. Hong (Eds.), *Media in China: Consumption, content and crisis*. New York, NY: Routledge Curzon.
- Shun, D. (2005). Convergence of radio/broadcasting/cable and telecommunications, a giant cable operator founded 广电与电信联姻 有线电视网络巨鳄浮出水面 [Electronic Version]. *China Youth 中国青年报*. Retrieved 3/25 from <http://it.people.com.cn/GB/8219/45424/45746/3270330.html>.
- Sicker, D. C. (2002, September 28-30). *Further defining a layered model for telecommunications policy*. Paper presented at the The 30th Research Conference on Communication, Information and Internet Policy Alexandria, Virginia, U.S.A.
- Sicker, D. C., & Mindel, J. L. (2002). Refinements of a layered model for telecommunications policy. *Journal on Telecommunications & High Technology Law*, 69-94.
- Sidak, G., & Spulber, D. (1997). *Deregulatory takings and the regulatory contract : The competitive transformation of network industries in the united states*. Cambridge, United Kingdom ; New York, NY: Cambridge University Press.
- Sirbu, M., & Zwimpfer, L. (1985). Computer communication standards: The case of x.25. *IEEE communications magazine*, 23(3), 35-45.
- SOE ownership reform-- which direction? (2004). *Beijing Review*, 47(37), 28.
- Solum, L. B., & Chung, M. (2004). The layers principle: Internet architecture and the law. *Notre Dame Law Review*, 79, 815-949.

- State Postal Bureau of China. (2000). Development and prospect of China post. Retrieved March 1, 2006, from <http://www.chinapost.com.cn/upuwx/posthistory/china/contents.htm>
- State Statistical Bureau. (2005). *China statistical yearbook 2005*. Beijing: China Statistical Publishing House.
- The strategy of communications equipment exportation. (2003, March 21). *China Electronic Exportation Research Newspaper 中国电子信息产品出口研究报*, from <http://www.ceiinet.gov.cn/scyj/txwl/200302110003.htm>
- Streeter, T. (1990). Beyond freedom of speech and the public interest. *Journal of Communication*, 40(2), 43-63.
- Tan, Z. A. (2002). Product cycle theory and telecommunications industry--foreign direct investment, government policy, and indigenous manufacturing in China. *Telecommunications Policy*, 26(1-2), 17-30.
- Taylor, R., & Zhang, b. (2005). *Restructuring china's information policy: WTO commitments, china's unique circumstances, and the "independent regulator" issue*. Paper presented at the TPRC.
- Telecom industry needs supervision, information minister says. (2002). *Asiainfo Daily China News*, p. 1.
- The Sixth Five-Year Plan for national economic development of the People's Republic of China*. (1983). Beijing: The People's Publishing House.
- The Progress & Freedom Foundation. (2005). Digital age communications act: Proposal of the regulatory framework working group. Retrieved 2006/02/10, from <http://www.pff.org/issues-pubs/other/050617regframework.pdf>
- Thierer, A. (2005). Are "Dumb pipe" Mandates smart public policy? Vertical integration, net neutrality, and the network layers model. *Journal on Telecommunications & High Technology Law*, 3, 275-308.
- Three Chinese telecom carriers rumored to swap CEOs. (2004). *SinoCast China Business Daily News*, p. 1.
- Trebing, H. M. (2000). Book review: Deregulatory takings and the regulatory contract. *Telecommunications Policy*, 24(2), 161-173.
- Trinkwon, D. (1997). Technology of fixed wireless access. *Telecommunications Policy*, 21(5), 437-450.

- Ure, J. (1994). Telecommunications, with Chinese characteristics. *Telecommunications Policy*, 18(3), 182.
- UTStarcom. (2003, December). UTStarcom: A case study. Retrieved March 11, 2006, from [http://www.utstar.com/Document\\_Library/UTSI\\_CS\\_ChinaTelecom.pdf](http://www.utstar.com/Document_Library/UTSI_CS_ChinaTelecom.pdf)
- Wan, Y. (2001). Sector reform. In J. Lin, X. Liang & Y. Wan (Eds.), *Telecommunications in China: Development and prospects*. Huntington: Nova Science Publisher, Inc.
- Wang, J. (2002). *Contemporary Chinese politics: An introduction*. Upper Saddle River, NJ: Prentic Hall.
- Wang, w., & Liu, x. (2002). China's telecommunication competition and regulation in face of globalization 面向全球化的中国电信业竞争与规制. *Economics and Management Research 经济与管理研究*(4).
- Wang, Y., & Hwang, A. (2006, February 16). Taiwan PHS operator fitel warming up for wimax operations. Retrieved March 10, 2006, from <http://www.digitimes.com/news/a20060216A9050.html>
- Werbach, K. (2002). A layered model for internet policy. *Journal on Telecommunications & High Technology Law*, 1, 37-67.
- Werbach, K. (2005). Breaking the ice: Rethinking telecommunications law for the digital age. *Journal on Telecommunications & High Technology Law*, 4, 59-95.
- Whitt, R. S. (2004). A horizontal leap forward: Formulating a new communications public policy framework based on the network layers model. *Federal Communications Law Journal*, 56, 589-672.
- Williamson, O. E. (1996). Deregulatory takings and breach of the regulatory contract: Some precautions. *New York University Law Review*, 71(4), 1007-1020.
- World Bank. (2004). *Telecommunications regulation handbook*. Retrieved 2006 April 17, from [www.infodev.org/files/1081\\_file\\_module2.pdf](http://www.infodev.org/files/1081_file_module2.pdf)
- Xu, I. (2002). A review of China's telecommunications reform: Experiences from global perspective 从全球电信发展中审视中国电信改革的特点. *商业研究 Commercial Research*(7).
- Xu, Y., & Liang, X. (2001). Policy and regulations. In J. Lin, X. Liang & Y. Wan (Eds.), *Telecommunications in China: Development and prospects*. Huntington, NY: Nova Science Publishers, Inc.

- Xu, Y., & Pitt, D. C. (2002). *Chinese telecommunications policy*. Boston: Artech House.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, Calif.: Sage Publications.
- Yoo, S. (2004). Information technology and economic development in Korea: A causality study. *International journal of technology management*, 27(1), 57-67.
- Yuan, D. (1999). Thoughts on how to build effective competitive telecommunications market 建立我国电信业有效竞争市场的思考 *MODERNIZATION OF MANAGEMENT 管理现代化*(06).
- Zhang, L. (2003, August 25). Finance, technology, management, every aspects are included 融资、技术、管理一个都不能少 *21 世纪经济报道*
- Zhang, X. (2001, January 9). The objectives of China's telecommunications reform 中国电信业的改革目标. *China Economic Times 中国经济时报*.
- Zhou, H. (1997). A history of telecommunications in China: Development and policy implications. In P. Lee (Ed.), *Telecommunications and development in China*. Cresskill, New Jersey: Hampton Press, INC.
- Zhu, J. (2005). The ownership reform of China's telecommunications: An economics perspective 中国电信业产权改革的经济学探讨 *Communications Today 现代通信*(12).

## VITA

**Chun Liu**

### EDUCATION

**Ph.D. Mass Communications – Law and Policy Track**, December, 2006  
The Pennsylvania State University, University Park, PA, U.S.A

**M.A., Telecommunications Studies**, August 2003  
The Pennsylvania State University, University Park, PA, U.S.A

**B.S., Computer Science**, August 1998  
Beijing University of Posts and Telecommunications, Beijing, China

### EMPLOYMENT

**System Engineer, Chengdu Long Distance Transmission Branch, China Telecom**,  
1998-2001

### RESEARCH AND SCHOLARSHIP

#### **Book Chapter (Most recent)**

Liu, C., & Lin, H. (2006). Implementing IPTV in China and Taiwan: Key Challenges. In M. Manglani (Ed.), *The Preston Gates Guide to Telecommunications in Asia* (pp. 71-83). Hong Kong: Asia Law & Practice.

#### **Journal Articles (Most recent)**

Gu, W., Liu, C., & Lin, H. (2005). Confucianism in making educational policies: Lessons from Mainland of China and Taiwan. *International Journal of Educational Policy, Research and Practice*, 5(4), 95-118.

#### **Conference Papers (Most recent)**

Lin, H., & Liu, C. (2006). *Effect of Message Framing on Promotion/Prevention-Focused Chinese Consumers' Purchase Decision*. Paper to be presented at the 56<sup>th</sup> Annual Conference of the International Communication Association. Dresden, Germany. June 19 - 23, 2006