

Market Performance of Chinese Telecommunications: New Regulatory Policies

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Chinese Telecommunications Policies**Abstract**

The structure, conduct, and performance of Chinese telecommunications are analyzed to determine reform's impact on policy objectives. Recent performance suggests that a more comprehensive reform is needed. However, China's fragmented policy environment makes large-scale reform difficult. Further deregulation of the telecommunication industry requires several related initiatives: reduction of entry barriers (to obtain multiple centers of initiative), creation of a universal service fund (to defuse stakeholder concerns regarding access), and formation of a cross-sector antitrust regulatory agency (with a special interest in promoting competition where feasible). While these policies could further complicate decision making in a fragmented institutional environment, each initiative is directed at neutralizing powerful stakeholders who can block or delay reform.

Key words: Telecommunications; institutional reform; China; competition policy

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1. Introduction

Recent reforms in Chinese telecommunications have led to significant capacity investment, which has promoted service expansion and the introduction of new technologies. However, improved sector performance requires changes in industry structure and incumbent behavior. The next stage of policymaking requires a coordinated approach that addresses three major problems.

The first problem is a market structure with substantial incumbent market power. When an incumbent exercises market power, telecommunications customers face high prices and a narrow range of service options. The second problem in China is one of cross-subsidies: from the telecom sector to postal services and from urban to rural areas. Future claims on subsidies will come from citizens in some rural areas who are not served by telecommunications companies at present. The current system of regulatory taxation creates constituencies who wish to maintain entry barriers and protect transfers to rural areas.¹ The third problem involves anti-competitive behavior by an incumbent. Predatory actions and interconnection delays harm entrants and ultimately limit consumer choice. Stakeholders benefiting from current arrangements support high entry barriers and a de-emphasis of multiple centers of initiative. A new cross-sector antitrust authority would be a powerful advocate for remedies and reforms to promote telecommunications competition.

A framework for analyzing policy initiatives is presented to demonstrate that the three problems cannot be dealt with in isolation. China's reform experience to date has brought lessons for policymakers that will help shape the next stage of reform. Of course,

institutional conditions in China place constraints on the nature of policy initiatives. Another feature influencing telecommunications developments is how international perceptions affect foreign investment and international business alliances. General economic conditions and resource availability in input markets also have implications for the timing of investments in the industry.

These features all affect basic industry conditions, which in turn influence industry structure, corporate conduct, and market performance. Of course, public policy determines industry structure (through the erection or reduction of entry barriers) and affects the behavior of market participants. While retail pricing behavior is often the focus of attention, other aspects of corporate conduct (like interconnection) have an even greater impact on industry performance and associated customer satisfaction. The next section incorporates these features into a comprehensive framework for analyzing prospects for change.

2. Framework for Analyzing Policy Initiatives

Each nation has unique characteristics that make it difficult to generalize from its experiences. Nevertheless, the political economy of reform has similar patterns, despite being embedded in different institutional settings. China has a huge telecommunications market with substantial commercial opportunities, which attracts potential entrants. However, as in most countries, it is difficult for political leaders to put aside the legacy of a dominant incumbent supplier. China Telecom has had powerful supporters within the government, as well as the value of brand name, managerial expertise, and knowledge of demand patterns. China Telecom was allowed to dominate the market for many years

under the protection of the former Ministry of Posts and Telecommunications (MPT), even after the initiation of the telecommunications restructuring in China.²

The introduction of new suppliers is seldom a simple process, whether the incumbent is a public enterprise or a privately owned entity.³ In the United States, MCI's initial entry into long distance service was a source of great contention, and FCC policy did not promote competition at first. The judicial system ultimately turned the tide to allow MCI to interconnect. Since then, stakeholders have continued to utilize legal challenges and legislative initiatives to delay or drive policy changes.

China Unicom's 1994 entry involved a parallel process in China, with some ministries supporting a new player and the MPT opposing competition for the incumbent, China Telecom. The MPT gave many reasons for opposing the establishment of China Unicom, then utilized the first-mover advantage and its authority as trade supervisor to drive China Unicom out of most markets and confine the scope of its transactions in others.⁴ As elsewhere, stakeholders have used the administrative process to block or slow change.

Momentum toward competition has been much stronger in the United States than in China. One reason is that U.S. deregulation has been accompanied by some emphasis on reducing cross-subsidies (by moving toward more transparent and targeted funding of universal service programs) and the existence of a strong antitrust tradition. These two complementary policies, missing in China, provide an institutional and legal basis for limiting predatory practices and the exercise of market power.

Programs targeting low-income subscribers have not eliminated political pressures to slow rate rebalancing, but they can be used to counter claims that reform hurts the poor.⁵ In

terms of U.S. antitrust, the 1982 consent decree resulting in the break-up of AT&T ultimately induced a voluntary divestiture a decade later.⁶ Thus, long distance appears to be relatively competitive in the United States at present. In China, however, the interests of the incumbent operator and the regulator were closely aligned, and entrants were treated unfavorably. In fact, China Telecom was a subordinate department of the MPT even after the entry of China Unicom in 1994, and its financial and personnel issues were fully controlled by other MPT departments.⁷ Therefore, the MPT adopted an asymmetric regulation that retained a favorable political and market position for the dominant China Telecom.⁸

This situation lasted until 1998, when a relatively independent regulator was established and the Ministry of Information Industry (MII) replaced the MPT. In 1999, the MII split portions of the former China Telecom into four independent groups: China Network Communication Corporation Ltd. (China Netcom), China Jitong Network Communication Corporation Ltd. (Jitong), China Satellite Communication Company, and China Mobile Communication Corporation Ltd. (China Mobil). Creating multiple players was a step forward, although the product segments that met different customer needs were of very different sizes.

The divergent interests diminish the ability of a single player to manipulate the political system. However, barriers to entry remained, and China Telecom continued to be responsible for both long distance and local fixed-network services. Hence, this sub-dividing of China Telecom was not a significant restructuring since the firm still enjoyed significant dominance in the fixed network. The subsequent breaking of China Telecom into North and South components in 2002 resulted in two independent companies

authorized to provide local phone service: the new China Telecom and the new China Network Communication Corporation. The extent of competition across regions remains an open question. To gauge the likely effects of recent restructuring, it is helpful to identify the features that affect sector behavior and market outcomes.

Figure 1 illustrates how national characteristics affect performance. This framework has too many features to be viewed as a “model” with a unique solution. There is no attempt to parameterize the relationships to show the relative strength of the different factors, to quantify causal links or temporal lags, to capture mutual interdependencies, or to fully develop other elements of underlying functions. Rather, the framework should be viewed as conceptual in nature—identifying the many factors that affect industry performance. Its utility lies in directing attention to features that might support (or hinder) the efficient delivery of telecommunications services.

The central role played by regulatory governance and associated regulatory policies places these factors at the center of the system. However, public policy is affected by a variety of forces, including institutions and national experience. In turn, policy affects the structure of industry, the behavior of firms, and sector performance. China is in the process of developing a system that is consistent with its configuration of institutions and resources. It is instructive to review each factor in turn and describe some elements that characterize telecommunications governance in China.⁹

[Insert Figure 1]

Experience: The first factor reviewed here relates to ways a nation has addressed policy

issues in the past. Experience shapes expectations and constrains the set of feasible government actions. Historical experience in China and throughout Asia is one factor affecting expectations by various stakeholder groups regarding the way the telecommunications sector is likely to be shaped by future public policy. One strategy involves depending on competition to signal where investments create the greatest value for consumers.¹⁰ High rates of growth in network expansion in China (relative to India, the Philippines, and other countries) indicate that state-led initiatives can be successful; however, special interests have affected market outcomes, maintaining high entry barriers, reducing transparency, and limiting competition.¹¹

China's historical record influences the perceptions of political leaders, business interests, consumers, citizens without service, and potential investors. The political will to create a sustainable (and effective) regulatory system is illustrated by the recent acceptance of the World Trade Organization (WTO) framework.¹² The likely institutional changes could create bureaucratic rivalry between a regulator (who might be tempted to promote incumbent interests) and an antitrust authority charged with investigating complaints and developing a factual basis for initiatives that address issues associated with industry structure and corporate conduct. In the Chinese institutional framework, such an agency would be partially insulated from sector-specific ministerial pressures if it had a mandate that cuts across sectors.¹³

To avoid political risk, China has employed a reform model called "act after trials". This means that, instead of initiating an overall reform by issuing new laws and completely adjusting the administrative regime, a feasible new system is found through some trial, with only limited, necessary modifications being made by the administrative regime. Once the

new system has been formally introduced, an overall reform is subsequently carried out. The process involves enacting state directives and completely reforming the administrative regime. China's policy experiment with telecommunications deregulation illustrates the political economy of reform. The experience of Hong Kong and mainland China supports the view that telecommunications deregulation is a process of political rivalry between powerful interest groups, and that the rate of deregulation varies from country to country because of the different political and economic systems in individual countries—in this case, different policies within China.¹⁴

Institutional Conditions: A second set of factors affecting a regulatory regime is depicted on the far left side of Figure 1: the underlying institutional conditions. These conditions include the balance between legislative and executive bodies, judicial capabilities (and independence), the administrative capabilities of oversight agencies, informal norms that influence contracts and economic transactions, and social consensus regarding actual sector performance.¹⁵ The New Institutional Economics underscores how governments tend to behave opportunistically toward those providing funds for infrastructure investments. Once funds are sunk into physical capital, the cash flows providing returns depend on regulatory policies. As with all nations, China's institutional endowment affects the design of the regulatory governance system and associated incentives (policies).

Institutions define the formal and informal rules within a society. Since new telecommunications initiatives are embedded in existing institutions, there must be consistency; otherwise, the new agency or set of laws will not promote change. Before

analyzing the set of regulatory arrangements consistent with current Chinese institutions, it will be useful to review the impact of international risk perceptions.

International Perceptions: China is perceived as having a giant market with solid prospects for future growth. International investors understand that the process of economic liberalization will continue, although the precise pattern in China is difficult to predict because of lack of transparency in the internal debate over new initiatives. International perceptions are influenced by the presence of a credible independent regulatory agency. Such a sector agency provides a signal for private investors, particularly foreign investors. In turn, economies with credible regulatory agencies can attract capital more easily since investors have an opportunity to earn a reasonable real rate of return; this feature allows governments to sell their shareholdings at higher prices so privatization can help the national Treasury.

General Economic Conditions: Macroeconomic conditions are clearly beyond the control of regulatory authorities, but they affect investment risk and prospects for demand growth. Poor harvests or natural calamities are the types of events that influence income growth, and thus the demand for telecommunications. Similarly, developments in the foreign exchange market have implications for the level and mix of economic activity.

The booming Chinese telecommunications industry is attributable to the rapid growth of China's economy and its market-orientated economic reform. China has been one of the most rapidly developing economies in the world for two decades. Meanwhile, the development of telecommunications has been given the highest priority because officials recognize that telecommunications facilitate economic growth and are central to the

modernization ambitions of the Chinese government. With substantial investment and favorable policies from central and local governments, the telecommunications sector has been the most rapidly developing industrial sector in China in the past two decades. For instance, the total revenue (turnover) of China Telecom increased from 13.41 billion yuan in 1991 to 135.55 billion yuan in 1997, about 1.8 percent of the GNP. By 2002, the total revenue for the Chinese telecom industry was 411.6 billion yuan (\$49.6 billion), up 14.4% from 2001.¹⁶

Input Markets: Economic development depends on input markets to attract financial capital, fund the purchase of equipment, provide skilled labor, reward entrepreneurship, and assemble natural resources. The impacts of input markets can be significant. Executives develop business plans based on the cost of inputs. A higher cost of capital reduces investments in new capacity, constrains projects for the delivery of new services, and causes substitution toward other inputs.¹⁷

The arrows in Figure 1 show the main directions of causation, but feedbacks are also present. The Structure-Conduct-Performance framework is predicated on underlying demands, technologies, information, and ownership arrangements. These basic conditions set the context for the number of firms that can “fit” into an industry. In conjunction with government policies, the conditions affect the structure of the industry.

Basic Conditions: To some extent basic industry conditions are outside the control of regulators, although public policy affects some of these fundamental conditions.¹⁸ For example, potential supply is determined by available technologies and input prices, but public policy determines access to the radio spectrum. Another element, effective demand,

depends on the size of the population, preferences, demographics, and income—all beyond the purview of regulators. Information is a fundamental element of basic conditions. Local managers know demand patterns and the potential for cost containment. Regulators can utilize benchmarking to partly offset this information asymmetry, but developing sound incentives requires that those designing incentives recognize this problem. Finally, ownership represents another factor influencing the number and size distribution of firms. In the case of China, public ownership of infrastructure generally involves territorial or product line monopolies, so any transition to more competitive environments must confront restructuring as well as private participation.

Regulatory Governance: Governance involves agency design and processes for involving all stakeholders in the development of policies. Those policies or rules can change over time, so the nature of the regulatory process takes on importance. China's "act after trials" approach to policy change can lead to disjointed policy initiatives that depend on getting a critical mass of stakeholders behind the broader initiatives. Because China's economic system is based on public ownership, both China Telecom and China Unicom remain state-owned. The Chinese government has adopted competition without privatization within the constraints of the traditional centrally planned economic system.

Most analysts view policymaking in China as rather complex and fragmented.¹⁹ Important players besides MII are the State Council (SC) and the State Planning and Development Commission (SPDC)—since 2003, the State Development and Reform Commission (SDRC). Regulatory policies must gain support from the SDRC and approval from the SC. Moreover, many interest groups with great bargaining power also exert

significant influence on telecommunication regulation and policy. Those with the most access to the state decision-making process gain from the non-transparent favor-granting process.²⁰

To safeguard the competitiveness of the telecommunications market, the Basic Telecommunications Agreement of the WTO²¹ requires that member countries be committed to establishing an independent regulatory body that “is separate from, and not accountable to any supplier of basic telecommunications services. The decisions of the procedures used by regulators shall be impartial with respect to all market participants.” In China, the interests of the incumbent operator and the regulator were not separate until after the MII was established in 1998. Although the MII is a government department rather than an independent regulatory agency in a real sense, it exerts a relatively neutral authority over telecommunications regulation because it no longer shares any common interest with the incumbent operator. Its major task now is to facilitate market competition.

Regulatory Policies: Figure 1 illustrates how regulatory policies establish incentives that affect three broad areas: market structure (related to entry and vertical integration/disintegration), corporate behavior (via price caps, cost allocation formulae, reliability mandates, service standards, or network modernization requirements), and industry performance (sharing rules that limit upside and/or downside returns, or penalties for missing regulatory targets for network expansion). In some countries, regulators have tried to micromanage the industries they oversee. However, they are unlikely to have comprehensive information regarding the feasibility of new technologies, opportunities for cost containment, or demand patterns for different customer classes.

Regarding market structure, one can argue that market design is one of the two most important facets of infrastructure reform, the other being the creation of an independent regulatory agency. As it follows government priorities, that agency is responsible for making decisions on interconnection policies, exclusivity periods, and access to essential facilities, all of which affect entry into telecommunications markets.

State-owned enterprises raise special problems for regulatory institutions, since agency-to-agency relationships require clear lines of authority and accountability—lines that political leaders often leave vague. International experience suggests that predatory pricing and other anticompetitive behaviors must be monitored by the regulatory agency or by some antitrust authority. In addition, for services provided under natural monopoly conditions, regulated prices will depend on accounting costs (for overall revenue requirements) and opportunity costs (if specific services are to be priced efficiently). Nations have used rate-of-return regulation and price caps as ways to limit the exercise of market power.

Performance-based regulation can promote cost containment and service improvements. For example, service quality regulations can specify rewards and penalties associated with reliability or customer service targets such as installation delays. Similarly, regulators often base the “X” for future price caps on yardstick comparisons: benchmarking results that rate firms according to relative production efficiency (stemming from innovations and sound management).

Another dimension of performance is profitability. Regulators elsewhere have utilized earnings-sharing rules for capping cash flows or setting floors on losses. Of course,

mandated cross-subsidies to other services represent another use of “excessive” returns. Finally, where the infrastructure is just being created, regulators often establish network expansion targets and reward good performance. To date, China has not utilized these valuable tools in any systematic way, except by using cash flows to subsidize postal services. Policies implemented since 1998 have addressed some of these issues, but additional steps are needed.

3. The Effects of the 1998 Reform and Policy Choice

It is difficult to realize full competition and rapidly improve the economic performance of China’s telecom industry merely by means of deregulation or announcements about liberalization. As was noted earlier, the Chinese telecommunications regulatory regime has undergone two rounds of reform, in 1994 and 1998.²²

In July 1994 when China Unicom was founded under the joint sponsorship of China’s Ministry of Electronics Industry, Ministry of Power Industry and Ministry of Railways, the intention was to break China Telecom’s monopoly by introducing competition. However, the original aim of separating enterprise management functions from government branches was not achieved and only superficial changes resulted. A new round of governmental reform began in 1998 with establishment of MII, which separated the functions of the government department (formerly the MPT) from those of enterprises. Another step involved splitting portions of China Telecom into four independent company groups with different product lines. The 2002 North/South separation of China Telecom represented another movement toward multiple centers of initiative. Arguments persist about whether telecommunications reform in China since 1998 has really created competitive pressures.

We use the structure-conduct-performance (SCP) framework to analyze the impacts of recent initiatives, considering market structure, entry conditions, and corporate conduct (unfair competition associated with predatory pricing and cross-subsidization).

The Number and Size Distribution of Firms: Prior to the North/South split, Herfindahl indices for the total industry indicated a tight oligopoly situation, with the numbers-equivalent being less than three firms for the total telecom industry.²³ Calculations of the HHI index show that recent reforms appear to have broken the pattern of monopoly in the Chinese telecom industry in part, with competition emerging in some market segments. However, large differences in competitiveness exist among different services, and the market for local phone service remains monopolized on a regional basis.

Entry Conditions: Barriers to entry are factors that hamper potential entrants and reduce entry incentives. These are generally divided into two groups: structural and behavioral. As Figure 1 shows, barriers to entry come mainly from the regulator and basic conditions. In China, there are three possible reasons for the regulator to create barriers to entry: to prevent construction of duplicative systems, to support relationships developed with managers of incumbent firms, or to protect fragile entrants from facing the full brunt of competitive pressures.

The first reason relates to considerations of natural monopoly and universal service (with cross-subsidies).²⁴ The government sets up barriers to entry to prevent firms from choosing to serve only the more profitable portions of the market. Although telecom technology continues to be upgraded by the incumbent, some analysts have begun to challenge the perceived need to prevent entry. It is difficult to determine whether the

telecom industry is a natural monopoly. Lacking conclusive evidence either way, the regulator is likely to maintain current arrangements, and protect the incumbent.

The long existence of a centrally planned economy in China has resulted in the integration of functions associated with government agencies and enterprises. The former MPT was both the administrative agency over the telecommunications industry and the operator of China Telecom. The ministry remained partial to China Telecom during the process of introducing competition. For example, when China Unicom began to enter the local long distance networks, the ministry created difficulties in the examination and approval procedures, and it imposed monopoly pricing for access payments.²⁵

Although not an operator, the current MII remains related to the enterprises being regulated. This point is illustrated by the fact that Yang Xianzu, the former vice-minister of MII, was appointed chairman of the board for China Unicom in 1999. In such circumstances, regulatory capture is still a possibility, and partiality toward dominant monopolists is unlikely to completely vanish.

Further efforts to increase the regulatory agency's independence and improve its oversight capabilities are called for. One possibility would be to combine the present MII with the State Administration of Radio, Film and Television to create a new agency with fewer ties to the leading operator in the market. At the same time, formulation of a Telecommunications Act could strengthen legal responsibility for regulatory oversight.

The third "justification" for erecting barriers relates to concerns for particular entrants. If potential competitors come into market freely, the newcomers might divide the small market share left to them when the leading operator has long held a large share of the

market. Thus, scale economies would not be achieved in the short run. In the absence of government antitrust action, entrants will tend to be acquired by the leading operator one by one, and the market could return to full monopoly. Some researchers think that if all restrictions had been lifted on market entry immediately after 1994, China Unicom would have soon disappeared. Accordingly, some analysts view barriers as necessary to prevent “excessive” entry.

To maintain a strong market position, the incumbent will also set up barriers to hinder potential competitors’ entry into the market. Despite reform, the local fixed-line network remains a monopoly of China Telecom and China Network Communication Corporation, which also have strong markets position in every service field compared with other operators. Therefore, it is probable that interconnection issues will discourage entry and possibly eliminate present operators in the market. Of course, whether China Telecom and China Network Communication Corporation exercise their power depends on incentives: effective compensation for network investment and the profit motive in a competitive market. There are incentives for dominant suppliers to charge high interconnection fees: the charge structure of China’s telecom industry is severely distorted at present.²⁶

Unfair Competition and Entry Barriers: Corporate behavior also affects entry conditions.

In the initial stage of telecom reform in China, the unfair conduct by China Telecom was obvious. Actions mainly involved predatory pricing, creating difficulties in interconnection and monopoly pricing for the use of essential facilities.²⁷ Usually, government departments backed the conduct. For example, after China Unicom came into the market, anti-competitive actions by the MPT included:

(a) Restrictions on China Unicom’s entry into the market,

- (b) Restrictions on China Unicom's access to the local phone network for interconnection,
- (c) Monopoly pricing with regard to access payments by Unicom,
- (d) Restrictions on China Unicom's sharing such public resources as phone numbers and radio frequencies,
- (e) Unfair competition in the form of cross-subsidies and low prices (dumping),
- (f) Other anti-competition conduct such as cutting off relay lines and damaging the reputation of China Unicom through comments to customers.²⁸

As reform has deepened in China's telecom industry, especially with the creation of the present MII and more operators in the market, enterprise conduct has improved, and managers attach more importance to the tasks of lowering costs and achieving technological and operational innovation to enhance their competitiveness. Price is a major means of competition. In addition, service quality has improved.²⁹ On its own initiative, China Telecom sent a group led by an associate general manager to other telecom companies such as China Unicom, China Railcom and Jitong to collect information about their interconnection concerns.

However, such developments do not mean that unfair competition has disappeared. For instance, the paging service formerly provided by China Telecom has been shifted to China Unicom for operation, but many local exchanges have begun offering paging service for only 20 a year, subsidizing the cost with high charges for local phone service. Another example has occurred in IP: some branches of China Telecom take advantage of their position in the local service market to create obstacles to the IP service offered by other operators. Some branches even make phony IP connections by using replaced circuits.

Just before China Railcom began business, China Telecom canceled its telephone installation fee, which was a heavy blow to China Railcom. In effect, recent conduct is similar to that of the initial stage of reform. Problems continue to crop up, particularly in the areas of interconnection and cross-subsidy. Until the monopoly of basic networks is broken and the leading operators are less able to dominate service fields, unfair competition will not disappear completely.

Similarly, the telephone exchanges in Tianjin and other Chinese cities added additional charges for local access because China Telecom would not approve their operation otherwise. When the leading operator has incentives to set up barriers, anticompetitive conduct will remain whenever the regulatory agency lacks enough information or, despite information, is unwilling to constrain high access charges. Thus, entry is delayed without new policy initiatives.

Further removal of restrictions on market entry, especially in local markets, is important. So long as an asymmetric supporting policy is pursued vis-à-vis the new operators and acquisitions are allowed among them, it is possible for a competitor to match the leading operator in time. Also, when restrictions are lifted, a regulator can acquire sufficient information from the competition of numerous operators to help it design and provide appropriate incentive mechanisms.

Product Cross-Subsidy: Identifying product-specific incremental cost remains a task for regulators. Clause 46 of the China Telecommunication Regulation issued by the State Council on September 20, 2000, makes inside cross-subsidy (across products) illegal. However, this has not been respected by many companies because no law spells out how violations are defined or how violators are to be treated.

An important technological feature of the telecom industry is the existence of common costs. Operators tend to distribute this cost in strategic fashion across different products and services. The leading operator, therefore, may price its competitive products and services very low while pricing those in its monopoly very high, creating product subsidies aimed at elbowing out competitors and preventing potential competitors from entering the market. For example, in October 2000, Nanjing Telecom paging station gave pagers as gifts (through drawing lots), and the provincial Jiangsu Telecom Bureau launched a large-scale “giving-free” activity in November 2000 for the whole province of Jiangsu. One can argue that strategic offers by dominant incumbent suppliers are examples of unfair competition.

Sector Performance and the Economy: What really matters from the standpoint of performance are the sector’s production, allocative, and innovative efficiency. Available statistics show rapid development of China’s telecom industry in the 1990s, with an average annual increase of 40 percent.³⁰ During the “Ninth Five-Year Plan” period, the rapid development of China’s telecom industry set a world record, with the fixed and mobile networks expanding at an annual average 4.6 million lines and new users reaching 3.7 million. By the end of 2000, the national telecom business income reached 307.4 billion, an increase of 26.4 percent. Investment in fixed assets grew to 213.5 billion, up 33 percent. Across the country, there are 20.1 telephone sets for every 100 people.³¹

The “Ninth Five-Year Plan” period saw a significant improvement in the overall level of China’s information technology. Such techniques as navigation positioning, remote control and telemetering have made China one of the world’s advanced countries in these fields. The TD-SCDMA put forward by China was regarded by the International Telecommunication Union (ITU) as one of the standards for third-generation mobile

communication proposals.

In spite of these achievements, a large gap between the level of China's telecom industry and that of other developed countries remains. Measured by revenue, the sector size in the United States amounted to \$178.7 billion in 1995, \$170.2 billion in the European Union, \$93.8 billion in Japan, and \$11.4 billion in Australia. China's telecom revenue was only 307.4 (\$37.1) billion even in 2000. As for revenue per employee, the average world level was \$126,000 in 1996: \$203,000 in the United States, \$208,000 in Germany, \$438,000 in Japan, \$139,000 in Brazil, and \$141,000 in the Republic of Korea. In China, revenue per employee was only \$54,000.³²

China's telecom industry lags in terms of such targets as trunk lines per employee and the utilization ratio of assets and prices. Also, economic performance varies greatly in different segments of the domestic telecom business. Because of relatively keener competition in the IP field, IP charges are the lowest. Users of mobile phones have increased at a faster pace than that of fixed-phone users, and the share of income from mobile service in total telecom income outstrips that of fixed-phone service.

On the basis of this review of the market structure, firm conduct and sector economic performance, it appears that China's telecom reform has weakened the monopoly of China Telecom. The 1998 reform has brought about a primary market pattern of competition, thus improving enterprise conduct and enhancing economic performance. Nevertheless, the monopoly in basic networks has not yet been broken: every business field suffers from asymmetric oligopoly. The May 2002 MII decision to split China Telecom into two companies based on geographic regions created some possibilities for local market competition, since both companies are allowed to expand their businesses and networks

nationwide. The ten northern provincial operations merged with the former China NetCom and Jitong to establish a new China Netcom Group. The twenty-one southern provincial operations became the new China Telecom. At present, there are six licensed telecom carriers in China: China Telecom, China NetCom, China Mobile, China Unicom, China RailCom and China Satellite. However, without market competition, dominant firms are in a position to exercise market power.

To sum up, China's recent telecom reform introduced some market liberalization and residual regulation, but has failed to accomplish sector goals in a timely fashion. Policymakers sensitive to the potential loss of economies of scope with many players in the industry may err on the side of fewer firms on the grounds that excessive fragmentation could reduce the ability of firms to respond to new technological opportunities. The downside of this orientation is that dominant firms become entrenched and lack incentives to innovate.

4. Meeting Policy Objectives

The preceding discussion of Figure 1 outlined the historical evolution of telecommunications reform in China, emphasizing the institutional elements that affect market structure, corporate behavior, and industry performance. When actual performance falls short of targeted objectives, policymakers need to understand the causal factors in the current system. Three objectives are emphasized here: universal service, cost reductions, and efficient pricing (based on competitive behavior where feasible). The first is a social objective, while the other two are linked to efficient resource allocation.³³

Universal Service: Countries and industries have different definitions of universal service.

The United States and the United Kingdom define universal service as the provision of quality telecom service at acceptable price levels for *all users and areas*, including low-income users and remote and other high-cost areas. But countries differ as to what specific services should be included. Generally, the rationale for universal service involves network externalities, concerns about income distribution, or regional development.

Because there are now only 20.1 phone sets in service for every 100 people in China, the process of providing universal service will involve significant network expansion. In addition, the definition and scope of universal service is somewhat elastic, which makes a consensus on what the term means problematic as high-speed Internet access becomes more important. Regional differences raise concerns: according to statistics issued for the first quarter of 2001, western China has only 11.7 phone sets per 100 people, 24 percent fewer than eastern China. Phone service is available to only 53 percent of the administrative villages in western China, 27 percent lower than the national average level.³⁴

One strategy for providing universal service involves narrowing regional gaps in penetration levels first. The close relation between expansion of the telecom industry and economic development suggests that regional targeting can make economic sense. Lessons from other nations and China's objectives indicate that basic telecom service targeted to low-income and high-cost areas is a reasonable definition of universal service for China.

Historically, universal service obligations were assigned to China Telecom, the leading operator, and were based on its cash flows from high-profit areas or businesses. However, high profits disappear once competition is introduced because newcomers can choose to enter relatively high-profit service fields or geographic areas instead of serving unprofitable

markets. This process leaves the leading operator unable to continue the practice of internal cross-subsidy if competition is introduced without corresponding changes in obligations.

One policy response involves establishing a universal service fund to compensate operators for providing services at prices below incremental cost. Experience in other countries shows that taxes on a competitive telecom industry can finance investments in basic service in low-income, high-cost areas. The government could allow operators to choose between the greater incentives represented by a global price cap contract and the lower incentives represented by a cost-based contract. In addition, some nations have auctioned the subsidies available for meeting certain obligations. This has led to much lower government outlays than projected by incumbents.³⁵ Considering China's low number of telephones and the great difference in telecom development in different regions, policymakers should not create unrealistic expectations regarding advanced services.

Incentives for Cost Reductions under Regulation: When competition is feasible, firms have clear incentives for cost containment and the introduction of valued new services. For market segments that remain monopolized, some form of incentive regulation can promote efficiency. Many countries have tried "managed competition" while in transition, but this policy can result in abuses by the government and dominant firms.

According to the theory of regulation, the main source of low performance on the part of monopolistic enterprises is lack of incentives for efficiency, especially under state operation or under cost-of-service regulation. Three main characteristics of business-government relations affect the degree of incentives: asymmetric information, regulatory capture, and concerns over regulatory commitment. Asymmetric information refers to the relative availability of information to enterprises and regulatory agencies. In

principle, a price cap creates high incentives to reduce cost, compared to a low-incentive mechanism like a cost-based contract. With the former, if an enterprise's cost increases by 1, its net compensation correspondingly decreases by 1, which puts a premium on the adoption of efficient production techniques.³⁶

The second feature of business-government relations that can dampen incentives to cut costs is regulatory capture. When the regulatory agency becomes a "partner" with the regulated enterprise, professionals at the regulatory commission begin to identify with colleagues in regulated enterprises, including those providing production and accounting information. This can raise the information rents available to enterprises, since it is difficult to design a high-intensity incentive mechanism when true production costs are unknown. Unorganized consumers are less effective in communicating their needs, so producer interests are likely given excessive weight.

Concerns about regulatory commitments can dampen an enterprise's willingness to undertake significant investments to reduce costs. At present, China's legal system is evolving, and its regulatory agency has limited independence, which can lead to a weak ability to make commitments. In such situations, a low-intensity (cost-of-service) incentive mechanism may be appropriate.

Efficient Pricing: Further Deregulation of the Telecom Industry: The objectives of universal service and production efficiency must be balanced against the objective of efficient pricing. Because of information asymmetries, potential regulatory capture (and political favoritism), and a limited ability to make regulatory commitments, the present regulatory system in China needs further reform. These three features characterize any regulatory environment, but state-owned dominant firms present particularly difficult

challenges for regulators. For example, there are few clear-cut property rights. Prevailing practice leads to control by insiders, with a lack of transparency regarding how decisions are made. The addition of new market participants can create pressure for telecom enterprises to have well-defined property rights; in addition, entry creates pressures for all market participants to improve their operating efficiency. Efforts should be focused on lifting restrictions on non-government investment, creating favorable conditions for telecom enterprises to go to investors for financing.

A key point is that China's commitment to promote competition is less credible with no antitrust authority. An antitrust agency can evaluate the policies of the regulatory agency, serving as a constraint on the regulator and increasing firms' cost of influencing the regulatory policy. Antitrust lawsuits, usually initiated by opponents of the monopolistic enterprise, can promote competition and provide relevant information for the regulatory agency. International experience suggests that the antitrust agency should be independent of other government departments, with special responsibility for supervising all trades and professions. This structure enables the agency to investigate potential violations and to bring lawsuits against monopolistic practices

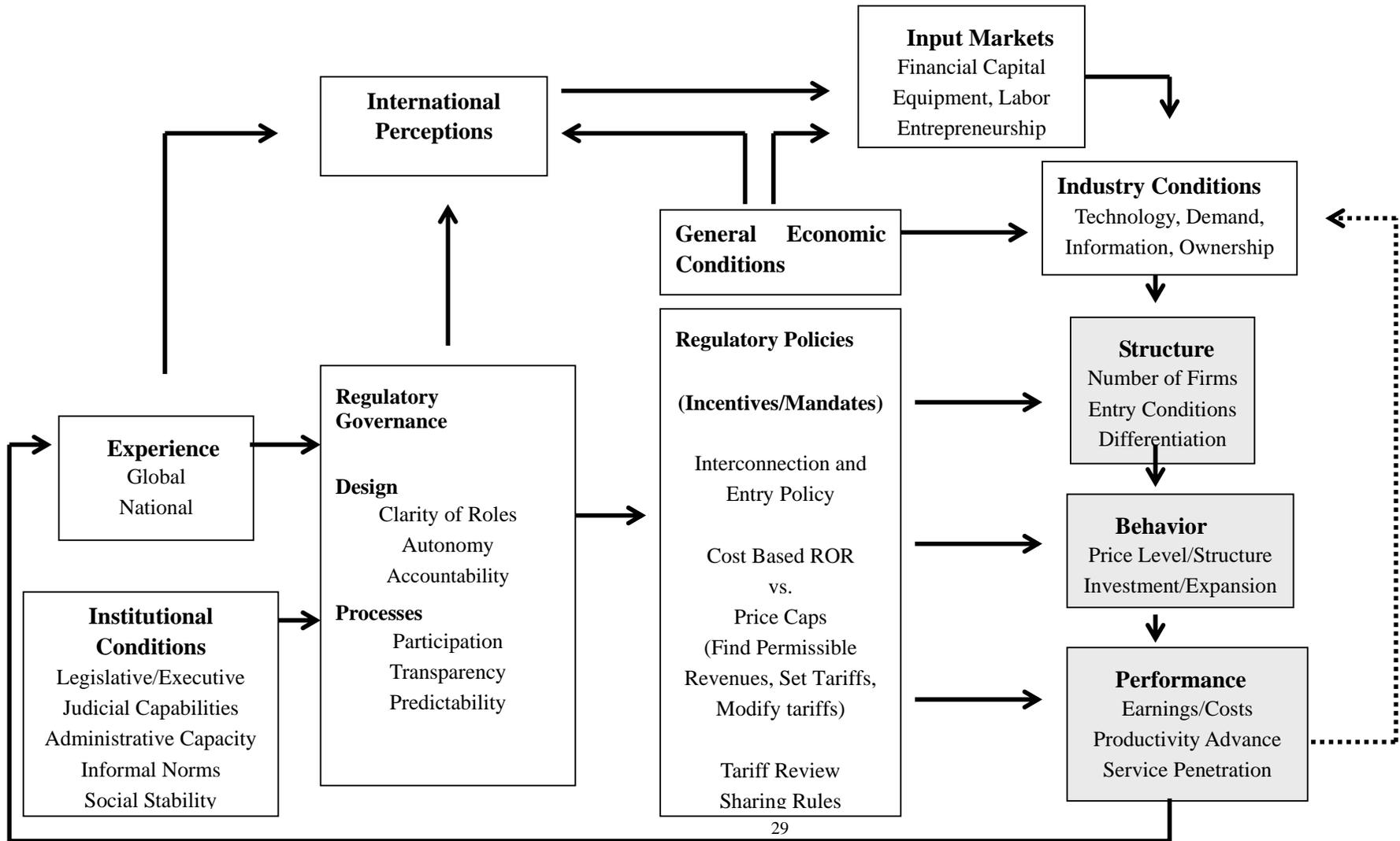
5. Concluding Observations

There is statistical evidence that comprehensive reform (including privatization, liberalization/competition, and the introduction of an independent regulator) promotes the availability of telecommunications services, service quality, and labor productivity.³⁷ The framework presented here directs attention to the next stage of China's telecom industry reform: addressing universal service, improving incentives for cost containment, and creating a cross-sector antitrust authority. When considering universal service, targeted

cross-subsidies funded through non-distorting taxes can diffuse general concerns that low income and rural customers will be harmed by reform. Focusing on incentives for production efficiency is another priority, since value creation can benefit both suppliers and consumers. In addition, strengthening the regulatory process and setting up an antitrust mechanism are essential to the reform process and to harnessing entrepreneurial initiative.

The fundamental conclusion is that, where competition is not feasible, the emerging regulatory framework must establish rules and incentive mechanisms that promote transparency, consistency, and broader stakeholder participation in the process. These steps can help limit the power of special interests. The framework presented here provides a set of organizing concepts for analyzing the determinants of market performance. In addition, it underscores the factors that warrant intensive investigation in the future.

Figure 1: The Effect of Institutions on Public Policy and Sector Performance



¹ In 2002, China Post completed its separation from the former governmental PTT structure. Post and telecommunications now operate independently in China. Hence the cross-subsidy from the telecom sector to postal service has been addressed.

² Yan, X., The impact of the regulatory framework on fixed-mobile interconnection settlements: the case of China and Hong Kong. *Telecommunications Policy* 2001, **25**(7), 515-532.

³ The long lags in Chinese telecom reform and the long transition period in both the United States and China are emphasized in Gao, P. and Lyytinen, K., Transformation of China's telecommunications sector: a macro perspective. *Telecommunications Policy*, 2000, **24** (8-9), 719-730. An examination of links between reform and the telecom equipment industry is found in Tan, Z. A., Product cycle theory and telecommunications industry – foreign direct investment, government policy, and indigenous manufacturing in China. *Telecommunications Policy*, 2002, **24** (1-2), 17-30.

⁴ Yan, X., 2001, *ibid*.

⁵ China Telecom revenues have been applied to cover postal service deficits, limiting MPT interest in reform. See Yan, X. and Pitt, D., One country, two systems: contrasting approaches to telecommunications deregulation in Hong Kong and China. *Telecommunications Policy*, 1999, 23(3-4), 245-260.

⁶ Potential economies of scope associated with network operation, the development and production of switching equipment, and the manufacture of computers were offset by likely loss of advanced switch sales to AT&T's former affiliates. The regional companies saw long distance service as a potential market and AT&T as a potential entrant into local markets. By spinning off these other activities, AT&T could focus on core network strengths.

⁷ Yan, X., 2001, *ibid*.

⁸ Gao, P. and Lyytinen, K 2000, *ibid*.

⁹ The general framework is outlined in Berg, S., Infrastructure regulation: risk, return, and performance. *Global Utilities*, 2001, 1(May), 3-10.

¹⁰ A review of telecommunications in Asia concludes that "introducing market competition is slow,

messy and difficult to manage but, where present, it is better for growth than privatization alone”

(Singh, J., The institutional environment and effects of telecommunication privatization and market liberalization in Asia. *Telecommunications Policy*, 2000, **24**(10-11), p. 885).

¹¹ Singh (*ibid.*, p. 900) argues that the “. . . Chinese state is also primarily driven by awarding of favors to groups with the most access to state decision-making.”

¹² An assessment of WTO agreements on telecom reform that does not explore the full implications of establishing a separate antitrust agency is found in Zhang, B., Assessing the WTO agreements on China’s telecommunications regulatory reform and industrial liberalization. *Telecommunications Policy*, 2001, **25**(7), 461-483.

¹³ It will be interesting to see whether the contrasting approach to reform in Hong Kong will yield lessons for the Chinese government, or whether political constraints limit the application of principles of reform. Both Hong Kong and mainland China are late movers in telecommunications deregulation. However, their approaches to deregulation have obviously differed, despite a shared common objective to fully propel the development of telecommunications with competitive mechanisms. In Hong Kong, all telecommunication sectors were fully opened for competition on January 1, 2000. Competition in international telecommunications has been particularly fierce.

Compared with mainland China, Hong Kong exemplifies the “fast track” route to deregulation. See

Yan, X and Pitt, D 1999, *ibid*.

¹⁴ Yan, X and Pitt, D 1999, *ibid*.

¹⁵ Formal rules reflect the actions of the legislative and executive branches of government. The resulting degree of social stability (cohesion) affects the effectiveness of the entire political system.

Another factor, judicial capabilities, basically determines whether a nation has a rule of law. The

legal system affects the predictability of the system and expected returns to investors. Another

element of institutional conditions is administrative capacity, which affects the implementation and

enforcement of laws. Finally, informal norms represent those values and customs that condition

day-to-day interactions. Issues of corruption, political stability (and legitimacy), respect for property

rights, and consistency in adjudication reflect a nation’s institutional conditions. See Levy, B and

Spiller, P, The institutional foundations of regulatory commitment: a comparative analysis of

telecommunications regulation. *Journal of Law, Economics and Organization*, 1994, **10**, 201-246.

¹⁶ See the MPT Annual Report for 1998 and the MII Annual Report for 2002.

¹⁷ As the cost of physical capital increases, there will be some substitution away from the relatively

more expansive input. Less capital will be used to produce given levels of output. In addition, projects will be ranked in the capital budget according to their expected returns (appropriately adjusted for risk). As the cost of capital increases, fewer potential projects will have returns that exceed the hurdle rate.

¹⁸ Berg, S 2001, *ibid*.

¹⁹ See Lampton, D., A plum for a peach: bargaining, interest, and bureaucratic politics in China, Lieberthal, K., Introduction: the fragmented authoritarianism model and its limitation, and Shirk, S., The political system and the political strategy of economic reform, in Lieberthal, K. and Lampton, D., *Bureaucracy, Politics, and Decision Making in Post-Mao China*, University of California Press, Berkeley, 1992.

²⁰ See Singh, J., 2000, *ibid*.

²¹ WTO Reference Paper on Regulatory Principles, 1997, <http://www.wto.org>.

²² For a discussion of initial reform, see Gao, P and Lyytinen, K 2000, *ibid*.

²³ The total volume of telecom business realized for 2000 was 449.4 billion, of which China

Telecom realized 174.3 billion; China Mobile, 209.67 billion; China Unicom, 64.1 billion;

China Satellite Co., 0.3 billion; Jitong, 0.7 billion; and China Railcom, 0.33 billion

$$H = \left(\frac{1743}{4494}\right)^2 + \left(\frac{2096.7}{4494}\right)^2 + \left(\frac{641}{4494}\right)^2 + \left(\frac{3}{4494}\right)^2 + \left(\frac{7}{4494}\right)^2 + \left(\frac{3.3}{4494}\right)^2 = 0.39$$

The Chinese telecommunications market has a numbers-equivalent ($N=1/H$) of 2.57 firms - still

highly concentrated (China's Telecommunications Annual Book 2001).

²⁴ According to traditional economic theory, the term "natural monopoly" implies scale economies from the production technology such that an industry is efficient only when a single enterprise operates in it. In contrast, new economic theory holds that natural monopoly originates from cost sub-additivity (which considers multi-product economies). With a natural monopoly, it is necessary for government to exercise regulation to prevent inefficiency brought about by duplicative construction. Since the telecom industry (local wireline networks in particular) usually features local scale economies, the telecom industry has been seen as a typical natural monopoly sector.

²⁵ See Zhang, W. and Hong, S., China's antitrust seen from a point of view of the telecom industry.

Economy Study Reference, 2001, **48**.

²⁶ A regulatory agency should provide strong cost-containment incentives for the enterprises under its jurisdiction. Specifically, the regulator for Chinese telecommunications might consider a global price cap contract, which shifts the initiative for pricing to enterprises, allowing firms to readjust prices according to competitive pressures. Limits can be placed on services where monopoly power is still exercised.

²⁷ High access price is a common barrier to entry when the leading operators are too strong. For example, the former MPT stipulated that if China Unicom's GSM mobile phones connected to local networks operated by China Telecom, China Unicom had to pay 80 percent of the related income for the connection. But if China Telecom connected into Unicom, it paid only 10 percent of the related income. Accomplishing interconnection between and integration of different telecommunication networks in China remains a policy challenge. See Yan, X., *ibid.* See also Yu, L. and Hu, Y., Regulation, deregulation and reform of China's telecom industry. *China Industrial Economy*, 1999, **4**.

²⁸ Zhang, W and Hong, H 2001, *ibid.*

²⁹ For example, the waiting time for the installation of phone sets was shortened on average from 15 days in 1998 to 10 days in 1999, and the average waiting time for rented lines to become operational fell from 23.3 days to 14.6 days (MII, People's P&T 2000).

³⁰ *Transportation Annual Book*. Chinese Statistic Press, Beijing, 2001.

³¹ MII, People's P&T 2001.

³² MII, Peoples P&T 2001.

³³ Zhang, X, *Regulation and Competition*. Social Science Literature Press, Beijing, 2000.

³⁴ MII, People's P&T 2001.

³⁵ When granting subsidies, the following practice might be considered. First, provide a "menu

that includes the high incentive represented by a global price cap contract and the low incentive

represented by a cost-based contract. The operator's own choice can identify universal service

business and competitive business. Then, the final subsidy amount is fixed via auction.

³⁶ Choosing between the two approaches requires a comparison of the overall resource costs of the

alternative mechanisms. A hybrid plan that caps returns represents one technique that maintains

relatively strong incentives while avoiding "excessive" profits or losses. Of course, a low-intensity

mechanism can effectively reduce the information rent left with enterprises; some analysts argue for

their use in China because of the relatively higher shadow price of public funds. See Zhang, X,

Network Industry: Theory of Regulation and Competition. Social Science Literature Press, Beijing,

2000.

³⁷ Fink, C., Mattoo, A. and Rathindran, R., Liberalizing basic telecommunications: the Asian experience. World Bank Working Paper, Development Research Group, 2001.