

Telecommunications Development and  
Policy Trends in the Republic of Korea

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## 1. PREFACE

Although a century has passed since the inauguration of the telegraph linking Seoul and Incheon in 1885, until the 1980's, the telecommunications industry had been relatively underdeveloped in comparison to Korea's other economic endeavors. For instance, there were only 3.49 million telephone lines at the end of 1981, a penetration rate of only 8.4%, and it used to take an average of 3 months to have telephone service available. These factors were attributable to the country's slow economic development.<sup>1</sup>

On the contrary, in the last ten years, the telecommunications industry in Korea has experienced dramatic changes. Today, Korea boasts one of the world's most modern telecommunication networks and advanced business industries. Korea has over 20 million telephone lines, thus a penetration rate of 40%, and enjoys immediate installation of telephone service at any place. Furthermore, all facilities have been upgraded with electronic switching systems which provide International Subscriber Dialing (ISD) service with the world, and Korea is now capable of developing and manufacturing telecommunications equipment, ranging from the telephone and fax machine, to digital switches and fiber optic transmission systems.

In the past, Korea's telecommunications policies had focused primarily on satisfying the demand for basic telecommunication needs, but Korea now embraces policies that promote competition in order to improve quality and innovation. The government has already taken steps to privatize the government-operated telephone company, Korea Telecom (KT), and has introduced other policies to stimulate competition.

The market liberalization plan was first announced in July 1990, and competition was introduced in the international telephone service, radio paging and cellular phone service markets from 1991 step by step. In addition, in June 1994, the government announced the policy to add a second service provider in all telecommunication service areas except local telephone service, and has since revised all relevant laws.

Telecommunications is an integral part of a social infrastructure which plays a vital role in its socio-economic development. But many countries still suffer with inadequate telecommunication facilities that significantly impact their economic competitiveness.

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<sup>1</sup> MIC, Korean Communications; Development Strategy and Results of the 1980'S, November 1988, P. 6

Many people are aware of the progress in the Korean telecommunications industry and are astonished by it. However, only a few individuals truly understand exactly how Korea was able to make this remarkable progress in such a short period of time and what policies played a key role in these developments. I believe issues related to the successful development and progress of the Korean telecommunications industry in the last 10 years are worthwhile and meaningful subjects to analyze. Therefore, I would like to review the major developments in Korea during the past 10 years and the background and issues of the first and second liberalization policies.

Section Two examines the status of the Korean telecommunications network and services by looking at basic telecommunications, mobile communications and VAN services. Section Three examines the policies related to network expansion and modernization policy, corporatization and special operator fostering policy and liberalization and privatization policy. Section Four provides an analysis of those policies and describes future policies. Section Five draws a conclusion.

## 2. CURRENT KOREAN TELECOMMUNICATIONS NETWORK AND SERVICES

The Korean market structure in telecommunications services can be classified into three categories: (1) Full competition; (2) Limited competition; and (3) Monopoly. The most competitive market is VAN service sector where no entry is restricted by the Ministry of Information and Communications (MIC). More than 200 businesses currently provide various VAN services and this number increases continuously. Effective January 1994, investment in this field is 100% open to foreign investors.

Limited competition is taking place in some basic telecommunication sector such as international telephony, radio paging and cellular phone services. Duopolistic competition is taking place in most of these markets. The radio paging market is divided into 9 regions, each with two competitors except for Seoul which has 3 companies providing service. The cellular service market was a monopoly, but in 1994 a nationwide cellular license was issued to a second service provider which is expected to be operational in January 1996.

### 2.1 Basic Services

Currently, domestic telephone services, both local and long distance, are provided by KT, which holds a monopoly in this market.

Korea ranks 8th in the world in terms of the number of line installations. There are over 20 million telephones lines (excluding 2.5 million PABX lines), a penetration rate of 40.1%, and no waiting required for services.

Korea has successfully expanded and modernized its telecommunications network during the last 10 years to achieve 100% electronic switching and 58.9% digital switching, with 35% of the network being switched by TDX, a switching system developed and manufactured in Korea.

Transmission systems are also being modernized and diversified through the use of optical fiber systems, digital microwave and PCM facilities and the long distance network is expected to be 100% digitalized by 1996. Furthermore, ISDN service became available in Seoul and 11 other major cities in 1993. There are approximately 285,000 public coin-operated and pre-paid calling card-operated telephones in the nation, there are plans to add credit card and IC card telephones in the near future.

In the international telephone service market, DACOM entered into competition against Korea Telecom in December 1991. DACOM provides international telephone service to 190 countries in over 238 regions of the world, and is able to offer most ISD service through undersea cables, INTELSAT and INMARSAT satellites. In leased line service, KT and DACOM compete with each other, and as of 1993 year end, 328,107 local, 54,534 long distance and 218 international lines were used for private line service.<sup>2</sup>

## 2.2 Mobile Communications Services

The radio-based communication service market has grown remarkably. This explosive phenomenon began in 1988, one year after the accomplishment of "1 phone per household," and has seen an annual increase of over 93%. (See Table 1)

(Table 1) Trends in Radio Based Telecommunications Service

Unit : 1,000

Classification/Year		'90	'91	'92	'93	'94	Average Growth Rate (%)
Cellular	Capacity	135	352	514	785	1,755	87.2
	No of Subscriber	80	166	272	472	960	
Paging	Capacity	535	1820	2,450	5,473	11,900	99.2
	No of Subscriber	418	851	1,452	2,648	6,360	

Source: MIC, Annual Report on Telecommunications, 1994

<sup>2</sup> KISDI, Communications Almanac, June 1994

Until the government issued a second license for cellular and paging, in order to foster competition, KMT (Korea Mobile Telecom) had monopolized the two markets. The Ministry of Communication had selected KMT as the wireless service provider under the special operator fostering policy in 1988.

From its inception in 1984, held 100% by Korea Telecom, KMT provided only paging services until 1988 when cellular services were added. KMT's cellular system is AMPS (Advanced Mobile Phone Service) based and has a capacity of 1,775,000 lines. It currently has 960,000 subscribers, about a 2.2% penetration rate, covering 57.6% of the geographic region and 90.6% of the population.

The MIC has granted a license to Shinsegi Telecom Corporation, a consortium of 245 domestic and overseas companies, as the second mobile telecommunications service provider. This consortium is composed of Pohang Steel and Kolong Group of Korea as its major shareholders, as well as Air Touch Communications, Southwestern Bell Corporation and Qualcomm Inc. of the United States. This is the first direct foreign investment permitted in a Korean telecommunications business. (See Table 2)

(Table 2) Shinsegi Consortium Share Distribution

Composition	Pohang Steel	Kolong	Air Touch	SBC*	Qualcomm	Others
Share holding Rate (%)	15	14	11.3	8.3	2.6	48.8

Source: Shinsegi Telecom, Mobile Communications Business Plan, June 1994

Shinsegi Telecom plans to build a digital network using the CDMA (Code Division Multiple Access) system, and is preparing to launch strong competition against KMT beginning in 1996.<sup>3</sup>

In 1992, the radio paging service market was divided into 9 service areas (approximately by province) with a total of ten companies in competition with KMT, with one for each local district and two for Seoul (KMT has the nationwide market). As of 1994 year end, the paging system had reached 6.36 million subscribers, (a 15% penetration rate) and had a capacity for 11.9 million lines.

In addition to these two services, in 1993, cellular public phone services were introduced in airport shuttle buses, express buses and express trains. In January 1994, air-to-ground service using the INMARSAT satellite was also introduced.

<sup>3</sup> Shinsegi Telecom, Mobile Communications Business Plan, June 1994.

## 2.3 Value Added Services

Anyone can offer enhanced services through registration with the Ministry of Communications. Currently there are 228 enhanced service providers and the number is expected to grow. (See Table 3)

(Table 3) Growth of Enhanced Service Providers

Year	'90	'91	'92	'93	'94	Growth Rate
Number of Agencies	6	30	69	156	228	389%

Source: MIC

These providers offer E-mail, EDI, CRS, credit card checking services and VMS, using leased private lines from KT and DACOM. In addition, they offer DB, DP service, packet switched service, PC communications service and MHS services.

Since KT and DACOM are in competition with the new service providers who must lease facilities from them, a policy to secure fair competition is developed. Although DACOM had originally been designated as the official service provider of the enhanced service sector, in 1985 DB/DP services were opened to the private firms. Additionally, E-mail, EDI and VAN service markets were opened for competition in 1989, and packet switched services in 1991.

DACOM currently offers packet switched services, DNS (DACOM Net Service), DB service, DACOM-EDI, DACOM-Mail 400, MHS service and international E-mail services. KT offers a packet switched service called HINET-P service, and a data base service called Hitel service.

EDS and IBM of the United States have invested 12.5% and 50%, respectively, in STM and SDS. 100% foreign investment has been allowed as of January 1994.

## 3. MAJOR TELECOMMUNICATION POLICIES OF THE LAST DECADE

### 3.1 Network Expansion and Modernization Policy

The expansion of the telecommunications network and the modernization policy, which have been promoted since the early part of the 1980's, have played an important role in bringing Korea to its global 8th ranking in telecommunications. Until the early part of the 1980's the Korean telecommunications system had



experienced chronic delays in meeting requests for telephone services; Korea was unable to meet the nation's demands. Compounding to the problem were various incompatible switching systems. The main switching systems were either Stroger or EMD (electro-mechanical switching systems), and many manual switchboards were still in operation. The increase in demand for telephone services was mainly due to the explosive economic growth that began in the 1970's. As Korean companies grew in size, diversified, and internationalized, a need for more reliable, quality services became evident.

To alleviate these problems, the government developed a plan to expand and modernize the communications network. During the 5th Five-Year Economic Development Plan, from 1982 to 1986, investment plans were made in the telecommunications facilities to add 6.28 million lines of network facilities. Advanced switching technology was introduced from the United States, Belgium and Sweden and were locally manufactured. The manufacturing capacity in electronic switching systems were expanded to more than a million lines, thus stopping the installation of electro-mechanical systems. At the same time, existing electromechanical switching systems in rural area (approximately 450,000 lines) were planned to be substituted by modern electronic systems .

Investment in the telecommunications industry not only increased in amount, but also in proportion to other industries. In the 1980's the average investment in this field was 4 to 5 times that of the 1970's, the ratio of investment to a gross fixed capital formation increased from 2.6% to 5.7% and ratio of investment to the gross domestic product increased from .8% to 1.7%. (See Table 4)

(Table 4) Electronic Telecommunications Investment by Sector

(Unit: \$1 million, %)

Classification/Year	'75-'79	'80-'84	'85-'88
Average Investment Amount	316	1,209	1,605
Telecommunications Investment/Gross Fixed Capital Formation (%)	2.6	5.7	4.4
Telecommunications Investment/GDP (%)	0.8	1.7	1.3

Source: MIC, Telecommunications of Korea, 1988

It is worthy to note that by 1986, Korea's rate of capital expenditure far exceeded the average world standard of less than 1% of the GDP and 3% of fixed capital formation.

All the plans up to 1986 were implemented successfully. By 1987, the number of telephone lines in Korea was over ten million and excess demand

problems had therefore been eliminated. Also, all facilities were automated and allowed for the DDD (Direct Distance Dialing) service to anywhere in the country. The total number of telephone subscribers had then reached 8,630,000, exceeding the number of households and, for the first time, the penetration rate had reached 20%. (See Table 5)

(Table 5) Telephone Installation Comparison

Year/Classification	Total Telephone Lines	Penetration Rate (%)	Automation (%)	Electronization (%)
End of 1981	3,491	8.4	89.3	6.7
End of 1987	10,221	20.5	100	7.2

Source: MIC, Telecommunications of Korea, 1988

To ensure a smooth and successful expansion, many existing problems had to be addressed. The most important of these were acquiring capital and technology for facility expansion and human resources for construction and network management.

#### a) Financial Resource

One of the most important method explored to acquire the necessary financial resources was the reinvestment of operating income. In the early stages, however, the operating income was insufficient to cover investment and other solutions were sought, including: (1) Revisions of the phone rate structure; (2) Issuance of bonds for facility construction; and (3) Foreign financing.

The originally low rate of local telephone rates were increased in accordance with the "end-user burden" principal. Between January 1980 and December 1982, the local phone rate rose three times, from 8 Won (approximately 1 U.S. Cent) to 20 Won (approximately 2.5 U.S. Cents). Also, long distance service rate was reduced, narrowing the gap between local and long distance phone rates.<sup>4</sup> In addition, the new telephone subscriber had the burden of a installation deposit between 122,000 Won and 242,000 Won (approximately 150 ~ 300 US\$), according to the district, which was refunded upon termination of service.

Another measure, "The Tentative Law for Expansion of Public Telephone Network," revised in 1981, required new subscribers to purchase bonds in amounts dependent on the telephone facility capacity of the specific district. The denominations of the bonds were between 9,500 Won (approximately \$12 U.S.) to

<sup>4</sup> MIC; Telecommunications of Korea, 1988, P.13.

200,000 Won (approximately \$250 U.S.). By the time this law was abolished in 1987, over 1,252 billion Won (approximately 1.6 B\$ U.S.) had been collected.

From 1982 to 1986, as yet another source of capital, the telephone company received financing of approximately 603 billion Won (approximately 750 M\$ U.S.) from foreign telephone switching system vendors. The sources of capital invested in the Korean telecommunications industry are detailed below in Table 6.

(Table 6) Sources of Capital Invested in Korean Telecommunications

(Unit %)

Classification/Year	'81	'82	'83	'84	'85	'86	'87
Operating Income	44.9	44.1	54.7	66.1	72.1	73.4	75.9
Foreign Loans	20.1	23.0	15.8	7.9	3.7	1.2	-
Telephone Bonds	15.8	11.0	12.9	11.4	11.9	12.7	11.2
Installation Fees	19.2	13.4	16.6	14.3	12.1	12.5	12.1

Source ; MIC, 1989

#### b) Acquiring Technology

The government actively promoted both R & D and the importing of technology from overseas in order to increase the capabilities of domestic telecommunications system manufacturing. Gold Star, Samsung and Oriental Electronic Communications Company acquired switching system technologies from the United States, Belgium and Sweden, and were successful in manufacturing large systems with capacities of 600,000 to 1 million telephone lines of each..

To develop domestic technology capability, KT dramatically increased its R & D investment and reorganized the Electronic Telecommunications Research Institute (ETRI) to include research of digital electronic switching systems and optical fiber transmission systems. Between 1982 and 1986, approximately \$300 million invested in development of Digital Switching System through joint research with ETRI and private manufacturing firms and successfully developed a new digital switching system, the TDX. In 1985, 24,000 lines were tested using TDX and in 1986, the mass production of the TDX system was put into effect. The TDX contributed greatly to the price reduction of foreign made switching systems, and later became the major system for the Korean network. (See Table 7)

(Table 7) TDX Supply by Year

Year	'85	'86	'87	'88	'89	'90	'91	'92	'93
TDX Supply (x1000)	24	189	206	341	529	1,130	1,666	1,355	1,472

Source: MIC, Annual Report on Telecommunications, 1994

### c) Establishment of KT a Separate Organization

In order to remove the burden of telecommunications investment and human capital cost from the government's budget and to increase efficiency, the telecom industry, which had previously been managed directly by the government, was spun-off to become the KT in January 1982. Hence, the corporation was able to execute independent investment decisions and business planning to meet the needs of the business. This independence led to flexible decision policies and, further, to industry restructuring. As a result, the number of employees increased from 35,000 at the time of the establishment of KT to 59,000 by the end of 1993. This sharp increase in the number of employees helped KT become one of the top 10 most desirable employment opportunities for graduating college seniors.

### 3.2 Corporatization and Specialized Operator Fostering Policy

Throughout the 1980's, although there were some movements toward liberalization such as opening the DB, DP service and CPE market to private, the telecommunications policy in Korea at the time could be characterized as "corporatization and specialized operator fostering policy".<sup>5</sup> Telecommunication business was separated from government body and each operator was designated to provide one service sector and not allowed to compete with each other over the same service. This liberal policy was considered in the interest of the Korean economy, but complete liberalization was not considered for fear that waste would be created by the duplicate capital investment required for full competition.

After the establishment of the KT in January 1982, the Data Communications Corporation (DACOM) was established in March 1982 to expand the capability and usage of information. Investment in the DACOM was provided 1/3 by KT and 2/3 jointly by private firms such as Gold Star, Samsung, Daewoo and Hyundai companies, etc. In March 1984, the Korea Mobile Telecommunications Corporation (KMT) was established with 100% investment from the KT. In the early stages, KMT operated radio paging service upon consignment from KT but in May 1988, it was designated by MIC as a mobile communication and radio paging service provider.

In December 1985, the Korea Port Telecommunication Corporation (KPT) was established as a joint venture with the KT and private companies, to offer marine-land communication services between land and ships anchored in port.

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<sup>5</sup> CHA, Y.S; The comparative study on telecommunications policies between the United Kingdom and the Republic of Korea, Sept. 1994, Univ. of Westminster, p. 13.

Because these new corporations were subsidiaries of KT, they were subsidized by KT through special agreements for discounts on leased lines and network interconnection and competition was not allowed with each other. That is to say, government specialized market into telephone, data communications, mobile communications, port communications, and kept control to avoid overlap and encouraged to concentrated on their own designated service to grow quickly.

### 3.3 Liberalization and Privatization Policy

#### 3.3.1 Liberalization of CPE and VAS

In January 1981, the MIC deregulated the monopolized customer telephone equipment market and granted the consumer freedom to purchase telephones from any one of numerous makers. In addition, in 1982, this policy was extended to allow for free connection of fax machines and modems to PSTN.

The policy to liberalize the customer equipment market was intended to promote competition, to encourage telephone manufacturers to offer more diverse capabilities, increase quality, and provide greater choices for consumers. By allowing for various CPE to connect to the PSTN, the MIC intended to maximize the utilization of the PSTN and to promote people's information communication usage. As a result, the number of telephone models increased from 3 to 234 in 1986 and domestic manufacturers were able to export 8 million telephone sets.

In 1985 competition was added to the value added service sector by permitting private companies to participate in the database (DB)/data processing (DP) industry. Although authorities exerted an effort to expand informational services after establishing the DACOM in 1982, progress in this field was far below expectation. The business customers expressed a great desire to enter the business by operating their own networks. Their rationale was as follows: (1) Protocol problems due to the many types of computers; (2) Diverse needs of consumers; and (3) Desire to resolve the problems of automating their data processing needs by building and owning their network systems rather than relying on DACOM.

Consequently, in 1989, the MIC completely deregulated the DB and DP service markets by enabling private companies to build their own network. Furthermore, the MIC opened the value added network service market by allowing private companies to register as service providers. The only exception to the deregulation was the packet switched service, which was defined as a basic service.

The government also took actions to supplement the low technology base in this area. Joint ventures with 50% foreign participation was initially allowed, and in 1994, 100% foreign investment was allowed.

### 3.3.2 Liberalization of Basic Telecommunications Service

#### a) The First Round of Telecommunications Industry Restructuring and Liberalization Policy

It seems that at the end of 1980, full-fledged competition began to shape the telecommunications market. Due to the successful implementation of the network expansion and modernization plans, by 1987, the total telephone capacity exceeded 10 million lines to completely meet the demands of the nation. Thus Korea had realized a 100-year old dream of immediate installation of phone service without any backlogs and automatization of all nationwide switching system. Subsequently, the MIC tried to change the policy from quantitative growth to improving the quality of service and diversifying it.

By the 1988 24th summer Olympic games in Seoul, the Korean economy had significantly improved and experienced a trade surplus. With the new economic stability, the government actively pursued liberal economic policies.

The improving economic conditions strengthened the investment capacity of Korean corporations. Hungry for new areas for investment, and with the recognition of telecommunications as one of the promising future growth areas, Korean corporations began applying further pressure on government to liberalize the telecommunications market. The desire of the private corporations to participate in the telecommunications business was further fueled by the declining cost of network equipment, a trend attributable to the rapid developments in technology. In England and Japan, private companies had already participated in the telecommunications business since 1984.

The changes in overseas and domestic markets lead the government to consider introducing competition in telecommunications and, finally in 1989, the MIC began a formal review of existing telecommunication policies. In 1989 the MIC established the Information and Telecommunications Development Committee (ITDC), composed of 96 experts from industry and academia to study the future policy direction of telecommunication industry. This committee, based on 10 months of extensive study and discussion, concluded that the monopolized

telecommunications market should be restructured, and that appropriate competition be introduced considering the peculiar characteristics of each segments.<sup>6</sup>

Upon the recommendation of the ITDC, in July 1990 the MIC announced its policy, “the restructuring and liberalization of telecommunications service industry”. Telecommunications service industry which had been lumped into a single public telecommunications service, and had to be designated by the MIC, were divided into three sectors: (1) General Service Provider (GSP); (2) Specific Service Provider (SSP); and (3) Value-Added Service Provider (VSP). The policy further defined new regulations specifying entry conditions, ownership share limitation, and foreign investment conditions for different business sectors. Table 8 shows the new classifications and related regulations.

(Table 8) Type and Regulation of Telecommunications Service Providers

Classification	General Service Provider (GSP)	Specific Service Provider (SSP)	Value Added Service Provider (VSP)
Types of Service	Voice telephony, Telegraph, Telex, Voice and non-voice mixed service, etc.	Mobile Communication, Port Communication (Marine telephone, Pier telephone) etc.	DB/DP, VAS, Data Communications, etc.
Condition of Participation	Designated by MIC	Licensed by MIC	Registration by MIC
Ownership Limitation	<ul style="list-style-type: none"> <li>• Prohibition on owning other basic service providers' shares</li> <li>• No more than 10% shareholding by individual</li> <li>• No more than 3% shareholding by equipment manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>• Prohibition on owning other enhanced service providers' shares</li> <li>• No more than 33% shareholding by one foreigner or individual</li> <li>• No more than 10% shareholding by equipment manufacturers</li> <li>• No more than 10% shareholding by any government-invested company</li> </ul>	<ul style="list-style-type: none"> <li>• No limitation</li> </ul>
Foreign Investment	<ul style="list-style-type: none"> <li>• prohibited</li> </ul>	<ul style="list-style-type: none"> <li>• permitted up to 1/3</li> </ul>	<ul style="list-style-type: none"> <li>• permitted up to 1/2*</li> </ul>

\* Restriction on foreign investment was lifted in 1994.

Source : Telecommunication Business Law and its enforcement regulation revised in 1991.

<sup>6</sup> KISDI; Recommendation of ITDC, January 1989

Consequently, KT family-operated monopolistic markets, including international telephone service, mobile communication and paging services, were opened to competition. In the VAS segment, market entry barriers were lowered and the business scope expanded to include some basic services such as packet switched services. Subsequently, swift actions were taken to implement the policy. In October 1990, the MIC designated DACOM as the second international telephone service provider, which then began competing against KT in December 1991. In 1992, the second cellular and paging service providers were selected. In February 1992, the MIC announced a request for proposal (RFP) with the intent to select the best applicant as the second cellular phone and radio paging service provider. Proposals from six consortia in cellular phone and 43 consortia in radio paging service were received by June and the best proposal was selected in August.

The paging service areas were divided into nine geographical areas. In each area, one license was issued (except for Seoul where two licenses were issued) to compete with KMT. These license recipients quickly prepared and initiated services in 1993.

The winner selected in cellular phone service was Taehan Telecom, whose flagship company was the Sunkyong Group. The selection caused much commotion and the government was accused of nepotism due to the fact that the chairman of Sunkyong and the incumbent president of Korea, Roh Tae Woo, were in-laws. Sunkyong ultimately returned the license. In 1994, the government revitalized the effort to select the second cellular service provider. In June 1994, the Shinsegi Consortium was selected; Sunkyong did not participate. The Shinsegi Consortium has selected the CDMA standard and is preparing to initiate its services in 1996.

#### b) The Second Round of Telecommunications Industry Restructuring and Liberalization Policy

In June 1994, the MIC announced the second round of the restructuring plan for the telecommunications services industry (The Second Liberalization Policy) based on the results of past market competition policies.<sup>7</sup> The two existing service sectors, general service provider (wired service) and specific service provider (wireless service), were consolidated into a single network based telecommunications service provider. This was designed to promote greater competition and allow service diversification of capable carrier. (See Table 10)

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<sup>7</sup> MIC; Direction of Structure revision of the Telecommunications Services Industry, June 1994.



(Table 10) New Telecommunications Service Industry Structure

Classification	Network based Service Provider (NSP)	Value Added Service Provider (VSP)
Business Classification	Owns and Operates its own Telecommunications Line Facility	Leases Lines from NSP
Service Area	Previously General Service + Specific Service	Same as Before
Condition of Approval	Licensed by MIC	Notification by MIC
Limitation on Ownership by a Single Entity	1/3 (Telephone Service 10%)	No limitation
Foreign Investment	1/3 (Telephone Service prohibited)	No limitation
Government Investment Organization	10%	No limitation

Source : MIC

The government revised the limitations in share ownership of the network based telecommunications service business, but these changes did not affect the telephone service sectors (local, long distance, international telephone services) since they provide basic public services. The new policy removed past restrictions (intended to protect against monopolistic effects of vertical integration by manufacturers) which had limited manufacturer participation in the specific service sector. Other regulations were also relaxed.

To stimulate greater competition, the new policy allowed the service providers more latitude in setting service rates. The regulation on rates over the dominant player will remain, but in the markets with sufficient competition, service providers will have freedom in setting rates. Furthermore, the law limiting the number of telecommunications businesses was abolished and the law prohibiting investments between Network-based telecommunications service providers was relaxed so that such investments can be made with MIC approval. The new entrants were obligated to provide universal services and to make investments for R & D.

The MIC also relaxed the limitation on 3rd party use of non-carriers' telecommunications facilities, other than their own business purpose such as electricity construction and operation (Electric power Corp.) road construction and maintenance (Road Construction Corp.) so as to provide their facilities to CATV operators. This policy was designed to find demand for the excess supply of network facilities which resulted from technological innovation.

To further the effort to liberalize the telecommunication markets, the MIC also decided to permit competition in the previously protected domestic long-distance (toll call) market and designated DACOM as a 2nd carrier in this sector on the 28th of February. No more licenses will be issued to international service only, but new domestic long-distance providers will be allowed to provide international service also when they are ready to serve. In this way, the playing field will be leveled.

Related to the PCS market, a nationwide service provider will be chosen in the near future. In the interest of economic efficiency, i.e. to avoid duplicated capital expenditure considering the large volume of initial investment, only one provider will be chosen at the beginning, but when demand dictates the need for more competition, more providers will be selected. In regard to Trunked Radio Service (TRS), the KPT will be licensed as the nationwide service provider, but another service provider will be chosen to provide nationwide digital service at a later date.

### 3.3.3 Privatization of Government Owned Businesses

As competition brought about changes in the telecommunications industry, the government decided to auction off its shares to the public. To ensure fair competition, KT's holdings in DACOM and KMT were also to be sold. The government plans to sell to the public 49% of its 100% holdings in KT in the near future. (See Table 9). All of KT's share in DACOM have been sold.

(Table 9) Auction Plans for Government Holdings in KT

Classification/Year	'93	'94	'95	'96	Total
Shares Sold (x1000)	28,790*	28,790*	40,310	43,190	141,080
Ratio (%)	10	10	14	15	49

\* 93-94 shares sold as planned

KT auctioned off 2,476,300 shares, thereby reducing its holding in KMT from 64% to 20%. Out of the 44% sold, Sunkyong has purchased 23% to become a major shareholder in KMT. The remaining 20% of KMT shares held by KT is planned to be auctioned off before 1996, when the second cellular service is scheduled to start. Thus, by 1996, the privatization of KT shares in KMT will be also complete.

## 4. EVALUATION OF THE POLICIES AND FUTURE PROSPECTS

### 4.1 Evaluation of Policies

The policies instituted in the 1980's, particularly the network expansion and modernization plan, have achieved remarkable results even by world standards. The number of telephone lines increased from a mere 3.5 million in 1981 to 20.8 million (penetration rate 40.1%) in 1994. Korea's telecommunications infrastructure has advanced significantly more than countries such as Mexico and Brazil that were at the same level of development in 1981. At the same time, Korea has reduced the gap with more advanced countries such as the United States and Japan. (See Table 11).

(Table 11) Comparison of Telephone Service Capability of Selected Countries

Country	Year	'81		'92		Growth Rate (%)
		Capacity	Penetration Rate (%)	Capacity	Penetration Rate (%)	
United States		94,457	40.9	143,325	56.1	2.8
Great Britain		19,089	34.1	26,880	46.8	3.2
Japan		42,539	35.9	58,520	47.1	3.3
Korea		3,491	8.4	*20,782	*40.1	14.3
Mexico		2,870	3.9	6,754	8.0	8.3
Brazil		5,378	4.5	10,872	6.9	6.3

Source: Siemens AG, International Telecom Statistics, 1994

\* As end of 1994

The Korean telephone network consists of 100% electronic switches, and 58.9% have been modernized with the network switched by digital switches. Over 7 million lines, 35% of all lines, were switched by the TDX developed in Korea. The number of cellular telephone subscribers were less than 2,731 at the end of 1984, but had increased to almost half a million by the end of 1994. The network expansion plan which was implemented to relieve the pressure from pent-up demand for service, increased demands for new network facilities, thereby contributing to the advancement of Korean switching system manufacturing and the successful growth of export revenues. (See Table 12)

(Table 12) Changes in the Telecommunications Manufacturing Industry

Unit : million \$

Year	Total Products	Domestic Usage	Export	Import	Export Ratio (%)
1985	817	877	246	307	30.2
1988	1,843	1,182	1,096	435	59.4
1990	2,395	1,851	1,122	579	46.9
1992	2,544	1,893	1,425	774	56.0

Source: Electronic Telecommunications Research Institute;  
Statistics on Telecommunications Information, August 1993

As the result of restructuring and liberalization of telecommunications service industry, traditional monopoly regime was broken down and the market is on the irreversible road toward competition and deregulation. It is pointed that Korea's liberalization policy has been closely linked to industrial policy factors such as the fostering of telecommunications industry and high-tech development with the recognition of the crucial role of telecommunication in economic development.

On the 1st round of liberalization policy in 1990, Trisectional structure, General Service, special service and value-added sector, was formulated and Government introduced competition in international telephone service, radio paging service and cellular phone service, etc. And full-blown competition was introduced in value-added service sector.

On the 2nd round of Liberalization policy in 1994, Korean Government simplified then existing Trisectional business structure to dichotomous frame, Network-based service (combined former subsection of General Service and Special Service) and Value-added Service sectors, distinguished by ownership of telecommunications line facility.

Substantial deregulation was also announced such as eliminating the ownership limitation for network equipment manufacturer, relaxing the limitation of 3rd party use of non-carrier's telecommunications facilities and tariffs regulation, etc.

The international telephone service market has made notable progress since the introduction of competition in 1991. First, the market has grown significantly. The total number of calls has increased from less than 231 million minutes in 1991 to over 406 million in 1994, a growth rate of 176%. Second, the international telephone rates lowered by 10 ~ 11%. Third, new services were introduced and quality of service was also improved. In 1994, DACOM's market share increased to

24.6% (originating calls) from 11.7% in its inaugural year 1991. These results attest to the successful introduction of competition.<sup>8</sup>

There are several factors attributing to the success of DACOM. First, the policy favored the new entrant DACOM, which was allowed to offer rates 5% lower than KT. Second, some digit of access code allowed consumers to use DACOM's services easily. (Unlike in the United States, Korean subscribers are not required to designate a specific long-distance carrier at the time of phone service installation and, similar to Japan, but they do not require extra numbers to dial than 1st carrier.) Before dialing an international number, callers merely press either 001 for KT or 002 for DACOM. Third, DACOM's business and PR/advertisement strategies were more aggressive than KT.

On the other hand, there were some extent of criticism that this has resulted from government's asymmetrical regulation but not from real competition.<sup>9</sup> Some also question how long this policy should continue. Others have argued that the benefits of competition in a duopoly market is limited and that the resulting rate reduction did not meet expectations.

The radio paging service sector, which has seen competition in each area, has also experienced significant progress. The number of subscribers increased from 1.45 million in 1992, the first year of the duopolistic competition, to 6.4 million at the end of 1994, witnessing a growth rate of 439%. Compared to the past, various kind of new services were added and the service coverage expanded.<sup>10</sup> The 2nd carrier's market share was increased surprisingly even though it was only one and half year after the competition. Market shares of new competitors vary from 24.1% ~ 36.3% by service area. (see Table 13). As evidenced by DACOM, the government's asymmetric policy such as 5% lower price for 2nd carrier and the effort made by the new competitor were major factors for the quick growth by new entrants.

(Table 13) Market Share of New Paging Service Providers (As of 12/94)

District (Wireless)	Seoul Co.	Nare Co.	Booil Co.	Serim Co.	Kwang Ju Co.	Chun Buk Co.	Choong Nam Co.	Woo Joo Co.	Kang Won Co.	Che Ju Co.
Share (%)	26.0	24.1	36.0	28.6	32.3	28.8	26.4	36.3	33.9	31.0

Source: MIC, Annual Report on Telecommunications, 1994.

<sup>8</sup> KISDI, Market Structure and tariffs after introduction of Competition in International Telephone Service, December 1993, P.43.

<sup>9</sup> CHA, Y.S., OP. CIT., P.38.

<sup>10</sup> KISDI, Efficiency Analysis of Introduction of Competition in the Paging Service, October 1994, P. 13

In the cellular communications sector, many people expect problems, e.g. call drop, poor call quality, inadequate coverage in tunnels and other areas, to be resolved and service quality to improve once the new entrant begins service in 1996.

Despite the enormous growth made in the basic services sector, the same progress is yet to be made in the enhanced service sector. The total 1992 revenue in this sector was \$440 million, only 5.4% of total revenues of the telecommunication services industry. (See Table 14) Most of the VAN service providers operate in deficit, and even those with profit are heavily dependent upon their affiliate companies as customers.<sup>11</sup> The lack of progress in the VAN service segment can be attributed to the Korean society itself, which lacks the understanding of the power of information and a structure which effectively utilizes information.

(Table 14) Market Size of Telecommunications by Service

Classification	Basic Service	Value Added Service	Others	Total
Total Sales (\$ Mil)	6,451	440	1,221	8,112
Share (%)	79.5	5.4	15.1	100

Source: ETRI, Yearbook of Information & Telecommunications Statistics, August 1993

Note: Based on 1992

#### 4.2 Future Prospect

The strategic importance of telecommunications proportionately increases, as the nation's economic prosperity becomes more dependent upon information. It is believed that as an infrastructure of the informational and technological society of the future and high value-added industry, telecommunications will play a critical role in strengthening the competitive power of Korea's socioeconomic. Also technological advancements will create new, innovative services and will challenge the traditional frame of regulation and composition of market structure. The results of the Uruguay Round and the formation of the WTO body will undoubtedly push every country of the world toward open door policies and globalization.

As we have observed before, it is likely that Korean telecommunications service market is on the irreversible road toward competition, liberalization and deregulation. Such kind of policies are well matched with overall economic policy

<sup>11</sup> Status Research on the Information and Telecommunications Industry, 1994

direction of Korean Government, it looks inevitable to cope with the evolution of technological upgrade and policy trends in the world.

In terms of restructuring, basic frame of business structure in telecommunications service industry in Korea looks almost final. However, individual industry's restructuring or reform would be strongly pushed to cope with such rapid changing environment in domestic as well as overseas. Especially KT, has enjoyed monopoly power long time and accustomed to that environment, has been felt a lot of pressure to reform it's structure and management.

Based on the positive result of competition in international telephone service and radio paging service, the more effort to expand competition in overall telecommunications service sector is expected. However, it is too early to expect full scale open competition in Network-based telecommunication service sector considering the limited resource while it needs huge amounts of initial investment. It looks gradual opening market approach, duopoly competition, would be continued for several more years.

The competition in long-distance telephone service, PCS and TRS sectors will be introduced in soon. The competition in cellular phone service (between KMT and Shinsegi telecom) and long-distance telephone service (between KT and DACOM) will be initiated in 1996. The Government will choose new service provider for PCS and TRS in soon. The KPT was already designated by MIC to provide nationwide TRS service with existing analogue technology. The Government will choose one or two more service provider with digital technology in this year.

One company will be selected at the early stage in PCS sector considering the mass amount of initial investment. The selected company should lead the development of PCS technology. KT would be the strongest candidate even though DACOM and KMT also eager to participate.

Local telephone service market is too early to expect the competition in the near future. It requires a large scale initial investment and the rate is lower than the actual cost although KT raised it several times in recent years. CATV industry in Korea is divided into 3 subsectors, system operator, program provider and transmission provider and is on it's infancy. Thus it is more difficult to utilize of which line facilities for local telephone than in other countries like in UK or USA.

In regulatory concern, the extent of deregulation will be accompanied along with the expansion of competition. The MIC stated recently that non-dominant

carrier's tariffs regulation will be relaxed. Nevertheless, the regulation over the dominant carrier's tariffs will be kept tightly to prevent from exploiting its market power.

Restriction of 3rd party use of non-carrier's telecommunication facilities, such as Korea Electric Power Corporation, Korea Road Construction Corporation, etc. will be relaxed. It is allowed to provide to CATV operator even though it is limited under the condition within its extra capacity. It is likely that such non-carrier's telecommunications facilities will become a back bone of 2nd carrier when Government allowed competition in local telephone service in the future.

While the overall regulation is relaxing, some other kind of reregulation is expected. Safeguard for the fair competition, separate accounting rules in accordance with service categories and interconnection rules among the different carrier's network will be set up. Common carrier like obligation, such as universal service provision and R&D activity will be charged to the new network-based service provider.

Along with the liberalization and deregulation policy in telecommunication service industry, Korean Government is expected to continue efforts to develop core technology to strengthen the competitiveness of domestic companies. Priority will be given for successful development of CDMA cellular system and PCS, enhancement of TDX system with ISDN feature and OF system to 10 GBPS will be also strengthen. It is likely that the private sector will take a greater role in technology development in coming year and joint development activities among the carriers, ETRI, and manufacturers will be enlarged.

## 5. CONCLUSION

As examined thus far, there are no other examples in the world today to equal the rate of development of the Korean communications system in the past decade. This success can be attributed to the government's solid planning, proper timing and execution of policies, and strong determination.

Policies, such as the network expansion and modernization policy, corporatization and specialized operator fostering policy, were instrumental in expanding and modernizing the Korean telecommunications network system. They provided the necessary legislation for acquiring human resources and efficient investments.



Also, success in the development of technology lead to the ability to manufacture and distribute the digital switching system and optical fiber transmission system -- Korea became the only nation among developing countries to do so. It seems that it was the right decision of the government to earmark a portion of the gross revenues of the KT for R & D purposes, to expand the facilities of the Korea Telecommunications Research Institute (ETRI), and to combine the research of manufacturers, scholars and other research institute.

Using the experience from the policies of the 1980's as a foundation, Korea is presently promoting liberalization policies in the telecommunications field, one step at a time. Of course, compared to the United States, Great Britain, Japan, Korea is still far behind in terms of applying liberal regulatory policies. Furthermore, although the scope and depth of Korean liberalization policies are behind those of advanced countries, considering its unique environment, Korea has made steady progress.

The value added service market has been completely liberalized and 100% foreign investment is possible. Successful competition was introduced in the international telephone service and paging service markets, and the second cellular telephone service provider was selected -- it is currently preparing to offer services. In June 1994, the government announced the Second Liberalization Policy, and amended all relevant laws in December 1994. Competition will be added in all segments of telecommunications except local telephone services.

However, the Korean information communications industry still has many weaknesses. In spite of the great progress made in basic communications, progress in the enhanced and value-added communications segments are still below expected levels and technology is far lagging behind those of advanced countries. Technology in the wired telephone segment has improved significantly, but development in the wireless and state-of-the-art communications technology have shown little progress. These areas must be immediately addressed. Furthermore, the Korean market still has many obstacles that prohibit foreign participation and is still subject to rate control by the government's consumer price control policy.

With the creation of the WTO, serious discussions regarding liberalizing the basic service market is expected to take place. Korea should, therefore, take further big steps to promote greater competition and deregulation. The government will also advance policies regulating the separate accounting system and interconnection between networks to ensure fair competition. Furthermore, it must thoroughly examine the issues related to CATV network, which has begun its service from March 1995, and efficient utilization of its own network.

Finally, it is imperative that the development of the information application market be actively pursued along with the enhancement of telecommunications service industry. To achieve this, both the public and private sectors must significantly increase investment in the development of the information industry.

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