kotra
Korea Trade-Investment Promotion Agency

ANALYSIS OF KOREA'S MOBILE COMMUNICATION INDUSTRY

The strengths of Korea's mobile phone market can be summarized as the following: world class mobile communications infrastructure, leadership position in the CDMA business, and the presence of diverse content developers.

INVEST KOREA

ANALYSIS OF KOREA'S MOBILE COMMUNICATION INDUSTRY

As the service fields in the wireless network industry become increasingly integrated, wireless network service providers - excluding mobile phone service providers - have experienced a decrease in market size and are increasingly operating in niche markets. As a result, the wireless network industry has centered itself around mobile phone service providers. The growth of the communication industry therefore relates with the demand for mobile phones and its communication equipment, as the mobile phone market evolves.

TABLE OF CONTENTS

OVERVIEW OF PRESENT MOBILE COMMUNICATION MARKET

The wireless network industry encompasses the wireless communication services market; including mobile phones (including IMT2000), trunked radio systems (TRS), wireless data communication services, and communication equipment.

As the service fields in the wireless network industry become increasingly integrated, wireless network service providers - excluding mobile phone service providers - have experienced a decrease in market size and are increasingly operating in niche markets. As a result, the wireless network industry has centered itself around mobile phone service providers. The growth of the communication industry therefore relates with the demand for mobile phones and its communication equipment, as the mobile phone market evolves.

1. Mobile Phone Services

History-the Origin and Development

The importance of mobile communication was first accounted for in the 1980s, as worldwide demand for wireless communication devices surged, and new communication technologies were introduced. To respond to the changes occurring within the communications industry, the Korean government established Korea Mobile Communications Services Co., (predecessor of SK Telecom) as a subsidiary of Korea Telecom (KT), in 1984. In its initial stages, Korea Mobile Communications Services Co. provided car phone services in urban areas based on analogue cellular service technologies. However, demand was low due to high equipment prices and limited user capacities. In the 1990s, demand for mobile phone services increased, and the digital system came to replace the analogue system, which could overcome user capacity limitations and security issues.

In the 1990s, as demand for mobile communication devices soared, the Korean government appointed a digital-based CDMA system as the standard for mobile services, in a move to accommodate the rise in users and overcome frequency shortage problems. In 1996, Korea succeeded in commercializing the world's first CDMA cellular phone. In 1997, the PCS mode for CDMA was adopted, and the digital CDMA phone service market went into full launch. This led to a sharp increase in sales of mobile phones.

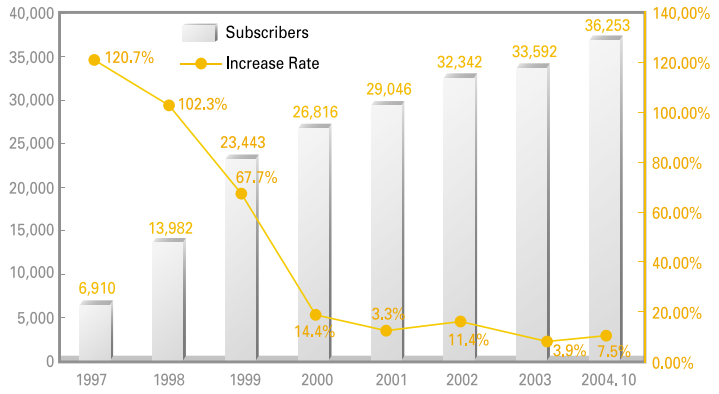
In 2000, SK Telecom was the first in the world to commercialize CDMA-2000 1x, the inception of IMT 2000 (International Mobile Telecomunications-2000). Using this technological breakthrough as a springboard, SK Telecom was able to venture into high-speed wireless data communication services, wireless internet services, and multimedia content services; leading the market in the mobile phone segment.

Market Growth

Strong demands have sustained the growth of Korea's mobile phone market: supported by advances in communication technologies and related industries, higher living standards of consumers, and competition between multiple providers. The number of subscribers has increased dramatically, from 6,910,000 in December 1997; to 36,000,000 in August 2004, or 75% of the total population.

Increasing Rate of Subscription to Mobile Phone Services

[Figure Ⅰ-1] (Unit:1,000 Persons/%)

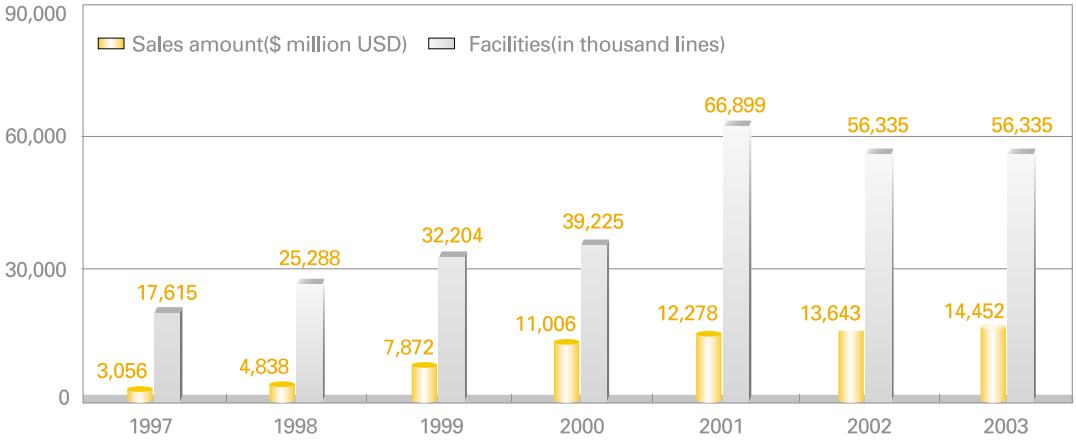


(Source: Ministry of Information and Communication)

Due to the early development of the mobile phone market, subscription rates have seen a steep drop, as the market matured. However, premium communication services such as CDMA2000 1x or 1x EV-DO, various multimedia contents, and Mobile Commerce services - provided by high-speed data communication third-generation networks - are perceived to be the new growth engines and profit centers of the future. Other growth areas include hi-tech handsets and new data services, which mark a turn from voice-centered services to communication-centered services as data communication services prevails. This goes on to show that the market for specialized services, rather than outward growth, will grow more competitive in the future.

Annual Sales & Number of Facilities

[Figure I-2]



(Source: Korea Association of Information & Telecommunication (Annual Information & Telecommunication Industry Statistic Report of 2003))

The market size of Korea's mobile phone services in 2003 was US$ 14.4 Billion; increasing 370% from US$ 3 Billion in 1997 (GDP growth rate was only 27% during the same period). Despite the economic recession following the 1997 financial crises, the mobile phone industry has sustained a high growth rate of over 10% every year. Because profit margins are highly dependent on the number of subscribers, it is prospected that sales growth will slow down in this sector, as the market saturates and intense competition drive steep price cuts. Since 2001, investment in network equipment has already seen a drop.

2. Mobile Phone Handsets

Samsung Electronics and LG Electronics are leading the market in mobile phone production, and through quantum leaps in technology they are now in the development phase of personalized and wide-ranged wireless services (2.5th generation), and complete mobile & multimedia service offerings by the integration of on/offline systems (3rd generation).

Presently the major firms holding key technologies and brand equity are leading domestic sales of mobile phones, and are also achieving significant results in foreign exports. Companies following these major players have accomplished domestic sales and exports through means of OEM and ODM. According to 2003 year end figures, Korea possesses 28.3% market share of mobile handsets worldwide. The market for other mobile communications equipment, such as repeaters, exchanges, and base stations, has formed around the domestic market.

History of the Mobile Handset Market

Since the inception of car phone services in 1984 and leading up to the early 1990s, sales of Korean cell phones were insignificant and relied mostly on foreign imports with the likes of Motorola and Nokia. In fact, in the early 90's, Motorola dominated the mobile phone market claiming 70% of market share.

In 1988, Samsung Electronics became the first domestic firm to produce cellular phones. However, due to low brand awareness and inferior technology, Samsung was only able to capture 10% of the domestic market. It was only after 1993 that Samsung began to surpass Motorola and lead the market by investing heavily in technological capabilities and brand name value.

In 1996, LG Electronics joined the mobile handset market. Together with Samsung, LG launched their CDMA cellular phones, and started invading Motorola's market share. When PCS phone services went into full commercialization, several mid-sized companies also entered the market, creating more competition.

Armed with technological know-how and competitive prices, Korean firms have been able, since the year 2000, to dominate the domestic market limiting Motorola's market share to less than 10%. Korean mobile phone producers have also become major forces in the global market by utilizing aggressive marketing strategies and capitalizing on accumulated technologies.

Present Market Condition & Growth Potential

Following the growth of the mobile phone service industry, the handset market has also grown significantly since 1997. The mobile phone market recorded slow growth in 2001 due to the discontinuation of government-paid handset subsidies, and a slowdown in new subscription rates. But since 2002, demand has recovered as exports have increased, and users have switched to new handsets.

In 2003, the mobile handset market size slimmed down reflecting low spending amidst a weak economy. In 2004 however, the market is expected to recover growth as the Mobile Phone Number Portability System goes into force, 2 to 3 mega-pixel camera phones are launched, and high-tech multi-media service handsets hit the market.

After the year 2005, the mobile market is expected to sustain growth due to the full launch of satellite & terrestrial DMB, 3G technology-based IMT-2000/W-CDMA services, and an increase in exports in emerging markets such as India.

< Production of Mobile Phone Units >

[Chart Ⅰ-1]

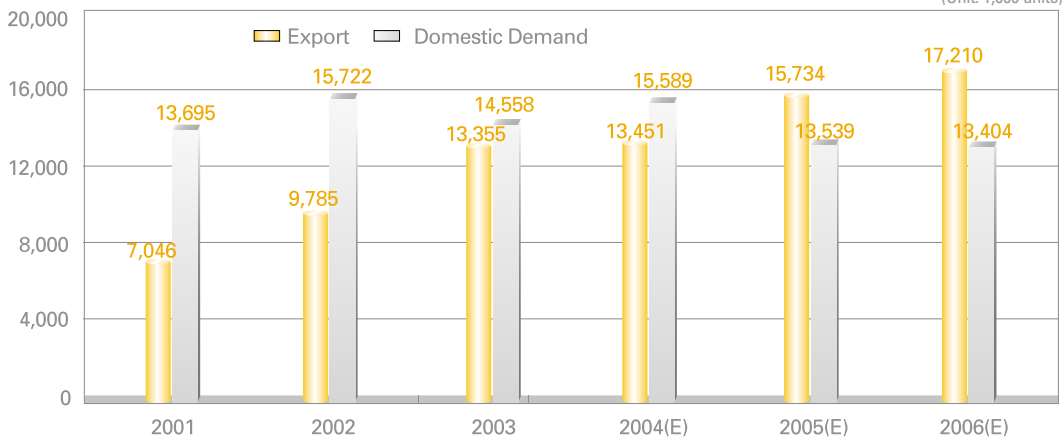
(Unit: 1,000 units)

	2001	2002	2003	2004(E)	2005(E)	2006(E)
Export	7,046	9,785	13,355	13,451	15,734	17,210
Domestic Demand	13,695	15,722	14,558	15,589	13,539	13,404

(Source : Research Center of Korea Investment & Securities, Korea International Trade Association)

[Figure Ⅰ-3]

(Unit: 1,000 units)



Source: KISDI

< Domestic Supply & Demand of Mobile Phones >

[Chart Ⅰ-2] (Unit: $ million USD)

	2000	2001	2002	2003
Production	7,847	14,486	20,207	21,102
Domestic Demand	2,283	6,335	9,296	9,368

(Source : Electric Industry Association of Korea, Korea International Trade Association)

< Exports & Imports of Mobile Phones >

[Chart Ⅰ-3] (Unit: US$ 1,000)

	2000	2001	2002	2003
Exports	5,509,338	7,046,419	9,784,731	13,355,293
Imports	113,975	73,694	147,287	112,148

(Source : Electric Industry Association of Korea, Korea International Trade Association)

Exports of Mobile phones make up 8.7% of total Korean exports, and 20.1% of total IT communication exports respectively. Using strong exports as a springboard, mobile phones are becoming one of Korea's three key export items, together with semiconductors and automobiles.

Exports of mobile phones are concentrated mainly in the European and US markets, and exports are increasing in newly emerging markets of India and South East Asia. In Europe, there is a high demand for color and camera-combined mobile phones, and in the US, Korean companies are leading the market in CDMA phones. In the case of China, exports have stilled due to an oversupply in inventories and the government-imposed quota system.

< Regional Export Trends >

[Chart Ⅰ-4] (Unit: US$ 1,000/ %)

	2000		2001		2002		2003	
	Amount	Ratio	Amount	Ratio	Amount	Ratio	Amount	Ratio
USA	3,312,666	47.0	3,267,790	33.4	4,663,174	34.9	5,001,260	37.5
Hong Kong	729,624	10.4	1,267,984	13.0	1,342,373	10.0	776,727	5.8
China	99,063	1.4	1,303,241	13.3	1,246,170	9.3	370,982	2.8
India	12,723	0.2	65,232	0.7	645,511	5.0	367,891	2.7
Singapore	308,250	4.4	437,354	4.5	415,682	3.1	362,719	2.7
Others	2,596,816	36.8	3,508,362	35.8	5,042,383	37.7	6,440,798	48..5
Total	**5,509,337**	**100.0**	**7,046,419**	**100.0**	**9,784,731**	**100.0**	**13,355,293**	**100.0**

(Source : Korea International Trade Association)

3. Equipment Industry (Focused on Repeaters)

Since 1997, the mobile communications equipment industry has grown with the surge of new users of mobile phones. Once the IMT-2000 service infrastructure is fully built, the equipment market is expected to enjoy a renaissance. But before that, mobile phone companies are expected to push the introduction of dual band repeaters which can support both CDMA networks and the new IMT-2000 networks simultaneously. With the integration of broadcasting & communication services and the introduction of 2.3 GHz wireless broadband services(WiBro services), the focus of communications is rapidly shifting from voice-centered systems to data-centered systems. Following the development and evolution of the mobile communications market, users are demanding high quality communication services that can be accessed when and where they want it. Therefore, repeaters will be in higher demand as they play the role of removing electromagnetic interference that occur inside buildings and in underground locations.

Industry Growth

The popularization of mobile communications has also brought forth a surge in the mobile communications equipment market. But since 1997, following a slowdown in user subscription rates and consequent mergers between mobile communication service providers, large forefront investments have decreased sharply, leaving equipment providers to sluggish demand. However, with the new Mobile Phone Number Portability System in force and higher quality communications in demand, investment for new equipment has been on the rise since the latter half of 2003. And as "high quality data-centered services" rise as the growth engine to overcome the slowdown in subscription rates, nationwide investments are being carried out for 3rd generation IMT-2000 infrastructures. At the same time, the imminent launch of Satellite DMB and WiBro services are creating favorable ripple effects for the equipment industry.

Competitive Factor

Repeater providers serve the market of major corporate and governmental institutions. More than 90% of demand is created by SKT, KTF, and LGT; the remaining 10% is made up of TRS service companies, police departments, airports, military communications and wireless data communication companies that own their own TRS networks.

The Character of Resources Supply

Raw materials and components are procured domestically, so no difficulty arises in securing materials.

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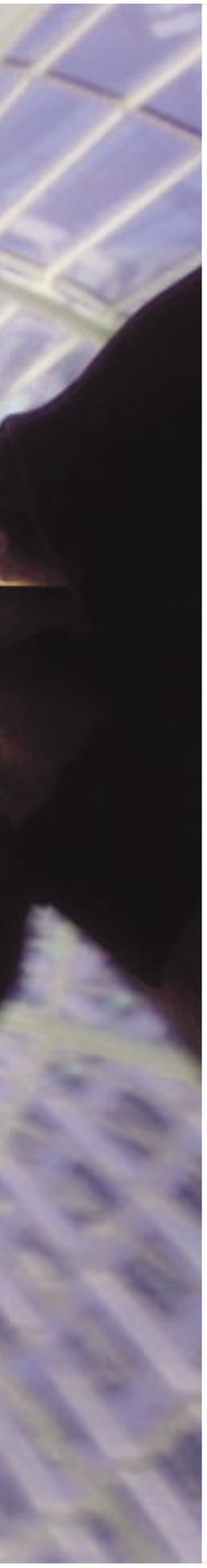
MARKET ANALYSIS



1. Mobile Phone Services Market

Market Characteristics

Despite the economic recession following the foreign financial crisis in 1997, the mobile phone market has shown strong growth. Further, demand for mobile phones has proved largely inelastic to fluctuations in the economy, because consumers view mobile phone services as necessities.

Demand for mobile phones are determined by the following: government handset subsidies, service providers, calling charges, and overall economic conditions. In the past, government subsidies played a critical part in determining consumption of mobile phones; however, since the prohibition of subsidies in December 2002, the quality of offerings such as wireless internet & data communication services, and reasonable charges have become the deciding factor.

The competitive edge of mobile phone providers is decided by brand power, product/service offerings and sales capacities. Brand image is determined by advertisements in various media channels and promotional events. The competitiveness of product/services is decided by the following: quality of voice transmissions, range of coverage, reasonable charges and different payment systems, diverse wireless internet service offerings and quality of access, the price range and functions of handsets, and customer services. Various marketing methods and distribution channels also affect the sales of mobile phones.

The mobile phone business is largely controlled by the government, both directly and indirectly. The Ministry of Information and Communication gives licenses to businesses in accordance with laws of the Telecommunication Business Act. The government also oversees payment rates and subscription conditions, among other things.

The Mobile Phone Number Portability System was effectuated in January 2004 to prevent monopolies, to provide a wide selection to customers, and to activate the communications market. SK Telecom, KT Freetel, and LG Telecom are now subject to the new system. It is perceived that this system will activate competition between providers, and as a result, offer a larger range of services at more competitive prices to customers.

Major Enterprises

Following the acquisition of Korea Mobile Telecommunications Services Co., (previously government-owned) by SK Group in 1994, the privatization of mobile phone companies began. In 1996, Shin Se Ki Telecom entered the market, and in 1997, 3 PCS makers(Korea Telecom Freetel, Hansol M Dot Com, and LG Telecom) joined in the competition to create a 5-company oligopoly structure. The competitive dynamics of the market changed as Korea Telecom Freetel absorbed Hansol in May 2001, and SK Telecom acquired Shin Se Ki Telecom in December 2002, creating a three-way oligopoly system. This structure remains to date.

< Market Share Based on the Number of Subscribers >

[Chart Ⅱ-1] (Unit:1,000 persons/ %)

	2001		2002		2003		2004. 1~6	
	Number of Users	Market Share	Number of Users	Market Share	Number of Users	Market Share	Number of Users	Market Share
SK Telecom	11,867	40.9	17,220	53.2	18,313	54.5	18,595	51.3
K T F	9,591	33	10,333	31.9	10,442	31.1	11,946	33.0
LG Telecom	4,276	14.7	4,790	14.9	4,837	14.4	5,699	15.7
Shin Se Ki	3,312	11.4	Acquired by SK telecom in 2002					
Total	29,046	100	32,342	100	33,592	100	36,241	100

(Source: Ministry of Information and Communication)

< Market Share Based on Sales Amount >

[Chart Ⅱ-2] (Unit: $ million USD/ %)

	2000		2001		2002		2003	
	Sales	Ratio	Sales	Ratio	Sales	Ratio	Sales	Ratio
SK Telecom	5,604	54.4	7,790	60	8,592	62.5	4,349	51.4
K T F	3,106	30.1	3,628	28	3,568	26.0	2,667	31.5
LG Telecom	1,603	15.5	1,550	12	1,579	11.5	1,4339	17.1
Total	10,314	100.0	12,969	100	13,740	100.0	8,451	100.0

(Source: Financial Supervisory Service)

Presently, Korea's mobile phone service market is led by SK Telecom in the forefront, followed by KT Freetel and LG Telecom. Benefiting from government policies to promote competition (such as the Mobile Phone Number Portability System), KTF and LG Telecom are expanding their share of the market.

In early 2004, the Phone Number Portability System regulation was first applied to SK Telecom. As a result, subscriptions and market share increased for KTF and LG Telecom. However due to heavy marketing expenditures, profits are expected to be to remain similar to the previous year.

< Key Highlights of Korea's Major Mobile Phone Companies>

[Chart Ⅱ-3] (3rd Quarter 2004) (Unit: $ million USD/%/person)

	SK Telecom	KTF	LG Telecom
Type of Service	Cellular	PCS	
Affiliation	SK	KT	LG
Sales Amount	6,561	3,992	2,150
Operating Income	1,604	327	62
Net Income	1,041	166	- 7
Total Asset	12,545	7,363	3,363
Debt Ratio	105%	161%	285%
Retained Earnings	5,272	852	- 391
Networks	19,596,000	16,470	4,186
Major Shareholder	SK Inc 21%	KT 48%	LG Inc 37%
Domestic Demand Ratio	95%	100%	100%
Form of Foreign Investment	Solution Export, Investment in stock	-	-
Employees	4,060	2,451	1,302
Website	www.sktelecom.com	www.ktf.com	www.lgtelecom.com
Service Number	011, 017	016, 018	019
Tel	02-2121-2114	02-2010-0114	02-2005-7114

(Source: Financial Supervisory Service)

1) SK Telecom

SK Telecom was established through the acquisition of Korea Mobile Telecommunication Service Co. by SK Group in 1994, according to the government's privatization policies. SK Telecom then acquired Shin Se Ki Telecom in 2002, which held a market share of 11%. Presently, SK Telecom is the dominant player in the mobile phone market, carrying 51% of total subscribers (as of June 30 2004).

SK is a leading force not only in the domestic market, but also in the global market. It was the first company ever to commercialize 2nd generation digital mobile phones, and 3rd generation CDMA 2000 1x CDMA phones.

Based on their high subscription rates, SK retains high profits and a strong cash flow which enabled investment into new services and facilities directly from operating profits. The profitable structure of SK will play a significant part in securing its market leader position.

Despite SK group's liquidity problems arised from accounting frauds, SK Telecom has kept independent from its parent company, applying transparency to its business management. Also, in respect to operating efficiency such as termination rates and ARPU(service revenue per subscriber), and the number of networks, SK is ahead of its competitors.

Based on the high subscription rates, SK Telecom has an edge over its competitors in the data services market. And with its strong cash flows, SK Telecom will be able to cushion negative factors, such as government restrictions and investment burdens of IMT-2000 phones.

In 2004, SK Telecom underwent a 40-day sales restriction following the decision from the Communication Committee and Ministry of Information and Communication; it was also a year that the Mobile Phone Number Portability System went into force. However, these factors have not affected SK Telecom's short-term profitability or market penetration.

2) KTFreetel(KTF)

Amidst the trend toward integration in wired and wireless service offerings, KTF is functioning as the central hub for wireless communications within the KT group. KT, a dominant force in the wired communications market, is the parent company of KTF(48% equity stake), of which it is vertically affiliated. Although KTF is behind SK Telecom in market share by 18% points, it is the second largest provider holding 11,940,000 users (as of end of June 2004), and maintains a stable operating base and position within the market.

KTF has the ability to adapt to changing market conditions with the backing of operationally and financially sound parent company, KT, and the steady cash flows resulting from users' service charges. Steady funding enables KT to invest in equipment facilities and marketing capacities when needed.

In the future, rate discounts and heated competition to attract/detain users may hinder profits of mobile service providers. However, with diverse profit generating services such as data communication services on the rise, it is prospected that profits and cash flow will remain strong. Also, the scale and timing of IMT-2000 investments can be adjusted, so most of the incurred costs can be covered by operating income.

Since the introduction of the Mobile Phone Number Portability System in year 2004, competition has intensified between providers to offer competitive rates to customers. However this is not expected to hurt the profit structure of phone service providers; in fact, since the enactment of the policy, KTF has attracted more customers. Increased subscriptions, together with an upswing in data communication services will help KTF retain their market share.

3) LG Telecom

As LG group's wireless communication division, LG Telecom first entered the mobile phone market in 1997 as a PCS provider. To date(June 2004), LG Telecom holds 5,690,000 subscribers. Although a late mover in the mobile phone market and significantly behind competitors in both market share(SK Telecom and KTF increased their scale through mergers) and number of network facilities, LG Telecom has become the dominant force in mobile banking services. Since the latter half of 2003, LG Telecom entered coalitions with major and local banks, offering Korea's first-ever mobile banking (Bank-ON) services in over 2,500 branches nationwide. LG Telecom has also benefited with the Portable Mobile Phone Number Portability System in act, acquiring 6,000,000 new subscribers marking a 24% increase from the previous year. However, LG Telecom is susceptible to liquidity risks because its liabilities consist mostly of outside loans, and interest payments on debts are high.

Although sales are made mostly through agencies, LG Telecom has increased operation of company controlled sales branches (Ez-Posts) to recruit new subscribers. 30% of all revenues come from sales of LG Telecom handsets.

< Major Offerings of LG Telecom >

[Chart Ⅱ-4] (As of June 30, 2004) (Unit: $ million USD)

Business	Type of Revenue	Item	Main Brand	Sales (%)
PCS	Service	PCS service	Ez-I, bank on	1,500(70%)
	Product	Handset sales	LG-CYON	650(30%)

In 2002, LG Telecom was selected as the exclusive IMT-2000 CDMA provider; it is expected to become an influential force in the market of 3rd generation mobile communications.

Prospects

Korea's mobile phone market is expected to undergo a short-term slowdown due to market saturation, absence of new services and a weak domestic economy. Although IMT-2000 services have been offered since 2003, providers have postponed substantial investments in service offerings, due to excessive marketing expenditures spent on recruiting new subscribers since the enactment of the Mobile Phone Number Portability System.

Due to delays in IMT-2000 service offerings, Korea's mobile phone market is not expecting high growth in the short term. However, since voice-centered services have diversified into other wireless data services such as wireless internet, and high value-added data communications, sales have been on a continuous rise. Therefore overall market growth is forecasted.

However, in 2005, the competitive market dynamics following the Mobile Phone Number Portability System is expected to settle down, opening way for a full-scale launch of WiBro(Wireless Broadband Internet) services, IMT-2000 services and integrated wired/wireless/broadcasting services. Such services are expected to create new demand.

< Subscription and Sales Figures of Korea's Mobile Communication Market >

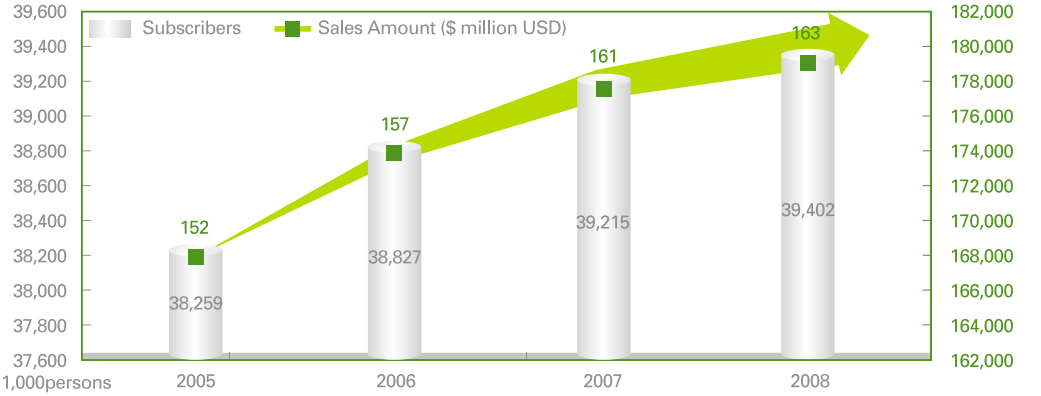
[Chart Ⅱ-5] (Unit: 1000 persons, $ million USD)

		2005	2006	2007	2008
Mobile phone service	Subscriber	34	35	35	35
	Sales amount	152	157	161	163
Voice sales amount		115	111	107	105
Non-voice sales amount		37	45	53	58

(Source: Korea Information Society Development Institute)

Subscription and Sales Figure of Korea's Mobile Communication Market

[Figure Ⅱ-1]



The Advent of New Communication Services

IMT-2000 services, anticipated to be the next generation growth engine for the IT industry, and the cause of heated competition between providers to acquire business rights, were launched in late 2003. However, full-scale service offerings have not been realized due to insufficient support from the government, technical problems, and substantial investment costs.

In April 2004, to keep in line with global standards, the government titled the 2.3GHz mobile internet as 'WiBro (Wireless Broadband Internet)', and in February 2005, three companies will be selected as WiBro providers. Presently(November 2004), three companies have applied to the Ministry of Information and Communication as prospective mobile internet providers: wired communications providers KT and Hanaro Communications, and wireless communication provider, SK Telecom.

According to Korea Information Strategy Development Institute(KISDI), total WiBro subscription in South Korea is projected to grow from 1.311 million in 2005 to 11.708 million by 2013.

< South Korea: WiBro Uses 2005-2013 Forecast >

[Chart Ⅱ-6]

(unit: million subscribers)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
Subscribers	1.311	3.633	6.732	9.401	10.831	11.408	11.614	11.685	11.708

(Source: KISDI)

Meanwhile, DMB(Digital Multimedia Broadcasting) services - which enable the transfer of digital media content such as music and video clips via mobile devices(ie: mobile phones, PDAs or portable TVs) – are expected to generate sales of over $800

million by the year 2010, according to In-Stat/MDR, the high-tech market research firm. Korea's state-backed Electronics Telecommunications Research Institute estimates the effect of DMB on the national economy to reach $13.36 billion by 2010.

Mobile internet services and 3rd generation services are expected to generate new demand in the coming years. However, if the services do not provide differentiated benefits from the existing services, they will most likely serve only niche markets, and it remains unknown whether they can support future growth in the mobile communications market. Another movement occurring in the mobile phone industry to sustain growth is the integration of mobile communications with other fields; the merge in wired, wireless, and broadcasting services to create an integrated network of data communications. This agenda will play a critical part in determining the future growth of the industry.

Enforcement of the Mobile Phone Number Portability System

The Mobile Phone Number Portability System was put into force in 2004 with the objective of offering customers convenient, wide-selection services from different providers, and to activate competition in the mobile phone market. In order to prevent monopolization by the dominant player in the market, the policy was enforced in succession starting with SK Telecom on January 1, 2004 and followed by KTF on July 1, 2004, and LG Telecom on January 1 2005. Since the enforcement of this policy, users switching to different providers have been given the prefix digit 010. In the year 2007, all mobile phone numbers will be standardized to the number 010.

Following the enforcement of the Mobile Phone Number Portability System, providers have engaged in fierce competition: cutting charges, offering customers additional services, and even engaging in illegitimate/expedient methods to recruit new users. (Some mobile phone providers were fined with a penalty in Feb. 2004, and suspended from business operations from June to September).

Until now, KTF and LG Telecom, the late movers in the mobile phone market, have been the benefactors of the new system. However because the Mobile Phone Number Portability System will apply to all providers in 2005, the market structure is not expected to undergo a major shakeup.

Service Expansion of Mobile Phone Companies

With the saturation of the existing voice-centered communication services, companies are now diversifying into new offerings. Sales of color LCD wireless internet phones are on the rise and diverse wireless communications services are coming out, such as: wireless internet services based on CDMA 2000-1x and CDMA 2000 1x EV-DO technologies, Telematics, and Multimedia Broadcast (DMB) services. These additional services are expected to support a steady growth in the industry.

2. Mobile Phone Market

Market Characteristics

The strengths of Korea's mobile phone market can be summarized as the following: world class mobile communications infrastructure, leadership position in the CDMA business, and the presence of diverse content developers. Its weaknesses include a lack of information on foreign markets, low brand awareness, high dependency on key component imports, and profit drops due to high raw material costs.

< SWOT Analysis of Korea's Mobile Phone Market >

< Strengths>	<Weaknesses>
• Modern handset designs • Economies of scale through mass production • Customers with sophisticated tastes • Status as CDMA leader • World class mobile communications infrastructure • Diverse multimedia communication service offerings • Presence of diverse content developers	• Fierce competition between Korean companies in the global market • Lack of specific information on foreign markets • Not yet licensed to manufacture in China • Royalty payments made to foreign companies due to absence of core technologies in Korea • Over-dependency on foreign high value-added core components • High expenditures for CDMA and GSM authentication • Decrease in profitability due to high raw material costs
<Opportunities>	**<Threats>**
• Expansion of production bases through ODM/OEM • Expansion of GSM mobile handset markets • Proximity to emerging markets such as China and Southeast Asia • Possession of core 5G, 4G technologies	• Rapid rise of Taiwanese and Chinese companies • Saturated domestic market • Weak expansion of the CDMA market, and fall in handset prices • Weak demands in overseas market with the delay in WCDMA introduction

The domestic mobile phone market reaps low profit margins, due to the high price of raw materials, and because the sales cycle is too short to compensate for development expenses.

Also, most domestic manufacturers are subject to pay royalties to Qualcomm for CDMA base band chips, so technology usage fees are high.

- Domestic firms pay a 5% royalty fee off the selling prices of handsets. Currently, as expensive camera phones become mainstream in the market (they are on average 20% more expensive than general color phones), exports and domestic sales are on the rise, but so are royalty fees. Korean companies have locked into a contract with Qualcomm to pay 5.25% royalty per price of handset for sales in the domestic market(excluding battery and package) until August 2006, and 5.75% for export items until August 2008.

< Profitability of Korean Mobile Phone Manufacturers >

[Chart Ⅱ-7] (Unit:%)

	2001	2002	2003
Rate of Operating Profit	6.3	7.2	2.4
Rate of Ordinary Profit	5.2	6.1	-0.4

Note: Includes audited companies with over 50% revenues resulting from sales of handsets.
(Appeal Telecom, Sewon Telecom, Wide Telecom, Modottel Giga Telecom, Motorola Korea, Pantech & Curitel, Telson Electronics, Pantech, VK, SK Teletech, and Nokia MC)
(Source: National Information and Credit Evaluation, Inc.)

Although profitability is declining, Korean mobile phone manufacturers still retain competitiveness in the global market through their stable manufacturing base, technology know-how of CDMA commercialization services, high preference for Korean providers in the world market, and a significant share in the Chinese market. Especially in the case of CDMA handsets, domestic producers are leading the world market by successful development of exclusive technologies.

In the field of supplementary technologies such as energy efficiency, minimization and lightweight production, Korean firms hold their own competitive technologies. As the quality of domestic technologies rise, so does the proportion of domestic production of key components.

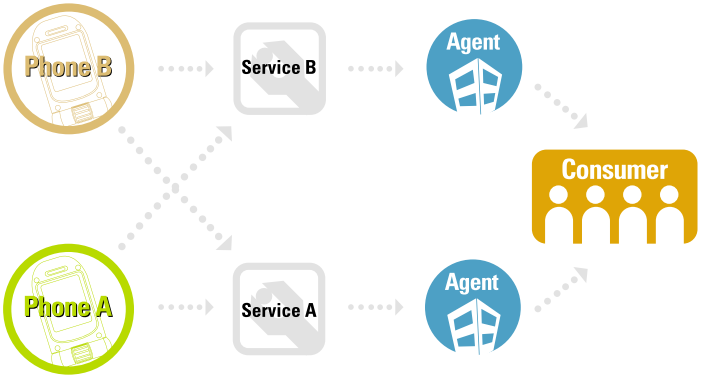
Distribution of Mobile Phones

Domestic handset companies sell their products to mobile phone service providers. Mobile phone companies, supplied with handsets from the handset manufacturers, then bundle the product with their service offerings and sell it to consumers. In other words, to receive mobile phone services, consumers first choose a handset of their liking, then receive a designated phone number.

This structure, together with the authority to designate phone numbers enables domestic mobile phone companies to wield substantial influence in the market. This makes it difficult for handset producers to retain their own distribution channels. This structure is expected to continue. Although handset producers have difficulty in acquiring their own distribution systems, they do not lock into exclusive contracts with mobile service companies, and use their brand power to engage in marketing activities; prompting competition in the handset market.

[Figure Ⅱ-2]

Structure of Domestic Mobile Phone Distribution



Major Enterprises

In 2004, the domestic mobile phone market consisted of leading companies such as Samsung Electronics having more than 50% of market share, LG Electronics having 20%, Pantech & Curitel that was separated from Hyundai Electronics and is the subsidiary of Pantech, and middle standing companies like SK Teletech, Motorola that is a subsidiary of Motorola Inc., Nokia, and Sewon Telecom and Telson Electronics who are operating with OEM and ODM modes. There are also companies that left the market since 2001, such as Standard Telecom, Wide Telecom, E.ron Technologies, and VK Corporation.

Samsung, LG, and Pantech & Curitel Possess more than 80% of the domestic market for the number of units sold and for the sales amount. But unlike the brand-owned companies, domestic market share of middle standing enterprises who are exporting with OEM or ODM mode is relatively small.

The mobile phone industry has kept high growth profile for years but the profitability is lower than the past's. This is due to the fierce competition driving the price down while the cycle of technology development is getting short and R&D and marketing expenses are getting higher than ever. Hence the accumulated losses made middle standing companies like Sewon Telecom, Maxon Telecom, and Telson Electronics go bankrupted in 2004.

If you look at the competitions in the mobile phone market in 2004, you can see that the market share of Samsung declined to 44% on first half year, which seems a temporary fall due to the supply problem of EV-DO chips from Qualcomm. Samsung will likely reclaim its market share and keep the leading position. LG Electronics, chasing right after Samsung, is keeping its second place in the domestic market by improved exports, but tough competition for second place is anticipated between LG and Pantech & Curitel, who has advantages in camera phones and is pushing the market with aggressive marketing strategies.

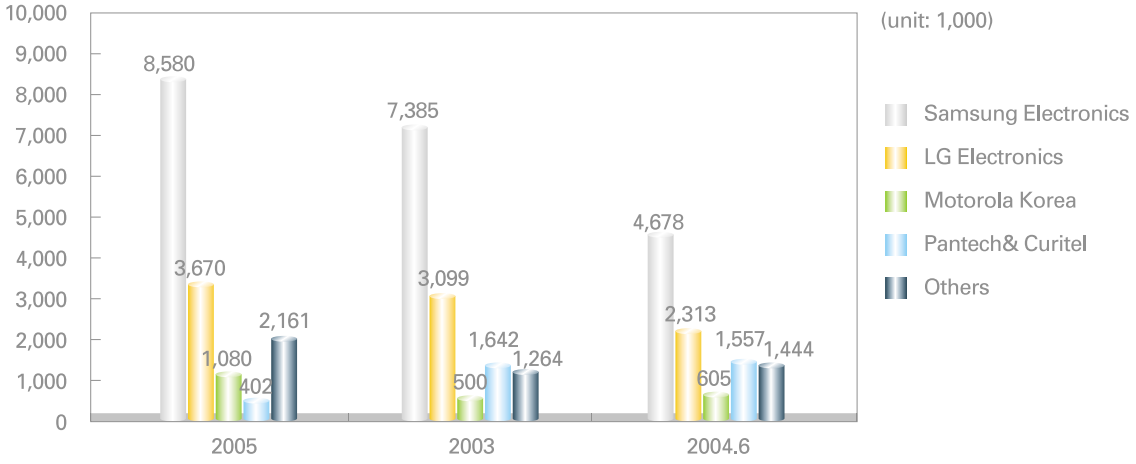
< Domestic Market Share by the Sales of Mobile Phones >

[Chart Ⅱ-8]

(unit:1,000)

	2002		2003		2004. 6	
	Units	Market Share	Units	Market Share	Units	Market Share
Samsung Electronics	8,580	54.0%	7,385	53.2%	4,678	44.2%
LG Electronics	3,670	23.1%	3,099	22.3%	2,313	21.8%
Pantech& Curitel	402	2.5%	1,642	11.8%	1,557	14.7%
Motorola Korea	1,080	6.8%	500	3.6%	605	5.7%
Others	2,161	13.6%	1,264	9.1%	1,444	13.6%
Total	15,893	100.0	13,890	100.0	10,597	100.0

[Figure Ⅱ-3]



(Source: Mobilecom I, Pantech & Curitel 3 Q Report

< Market Share by National Enterprises Sales >

[Chart Ⅱ-9]

(Unit: $ million USD/ %)

	2001		2002		2003	
	*Sales	Market Share	Sales	Market Share	Sales	Market Share
Samsung Electronics	6,398	56.0	9,642	62.6	12,678	60.1
LG Electronics	1,968	17.2	2,003	13.0	4,714	22.3
Pantech & Curitel	692	6.1	663	4.3	1,227	5.8
Appeal Telecom	311	2.7	625	4.1	444	2.1
SK Teletech	308	2.7	489	3.2	572	2.7
Pantech	328	2.9	476	3.1	539	2.6
Motorola Korea	612	5.4	399	2.6	262	1.2
Sewon Telecom	470	4.1	372	2.4	456	2.2
Telson Electronics	81	0.7	287	1.9	304	1.4
Standard Telecom	61	0.5	144	0.9	-	-
VK	0.9	0.0	115	0.8	172	0.8
Eron Technology	5	0.0	57	0.4	-	-
Modottel	11	0.0	40	0.3	17	0.1
Widen Telecom	16	0.1	39	0.3	51	0.2
TBK Electronics	83	0.7	20	0.1	11	0.1
Hanwha	61	0.5	18	0.1	-	-
Erae Electronics	6	0.1	7	0.0	17	0.1
Total	11,419	100.0	15,404	100.0	21,102	100.0

(source: National Information and Credit Evaluation *Note: Sales of Mobile phone of each company)

< Information of Main Enterprises >

[Chart Ⅱ-10]

Company	Samsung Electronics				
History/ Ownership	1969 Established 1989 Developed first mobile phone in Korea 2000 Rose up as mobile phone seller ranking 4th in the world 2003 Rose up as mobile phone seller ranking 3rd in the world (World market share 10.8%, sales volume : 55,700,000 units) Samsung group is the major shareholder (over 20%)				
Sales ratio	Device Solution 45%, IT 31% , Media&Appliance 24%				
Export ratio	Export: 78%, Domestic ratio: 21%				
Brand	Anycall				
Sales channel	Domestic: through agents or mobile phone service companies Export: through oversea subsidiaries, branch offices or directly				
Financial status (unit: $ million USD)		2001	2002	2003	2004. 9
	Sales amount	29,436	36,193	39,620	39,760
	Operating revenues	2,086	6,798	6,538	9,530
	Net income	2,678	6,410	5,416	8,146
	Debt ratio	43%	40%	33%	28%
	Cash from operating	5,718	10,175	8,952	10,870
	Liquidity ratio	107%	160%	146%	165%
	Retained earnings	12,138	18,472	22,190	26,135
	Samsung Electronics is a fast growing company owing to the increasing sales of mobile phones, LCDs, and the memory business sector. It generates healthy cash flow from operating and keeps debt ratio low. The company has neither long nor short term debt except company bonds. The company has enough capabilities to invest in new businesses as well as R&D				
Prospect	The company is expected to improve profitability of all business sectors this year. And also anticipates that it'll remain a leading company in the domestic market from the past R&D capabilities and development speed of new products.				
Website / TEL	www.sec.co.kr / 031-200-1114				

< Information of Main Enterprises >

[Chart Ⅱ-11]

<table>
<tr><th>Company</th><th colspan="7">LG Electronics</th></tr>
<tr><td>History / Ownership</td><td colspan="7">1958 Established
2003 Rose up as mobile phone seller ranking 5th in the world
Major shareholder: LG 32%</td></tr>
<tr><td rowspan="5">Sales
(unit: $ million USD)</td><td></td><td colspan="2">2002</td><td colspan="2">2003</td><td colspan="2">2004</td></tr>
<tr><td></td><td>Export</td><td>Domestic</td><td>Export</td><td>Domestic</td><td>Export</td><td>Domestic</td></tr>
<tr><td>Digital Media</td><td>4,229</td><td>1,161</td><td>5,229</td><td>1,030</td><td>3,477</td><td>645</td></tr>
<tr><td>Appliance</td><td>1,894</td><td>2,065</td><td>3,365</td><td>1,769</td><td>2,290</td><td>880</td></tr>
<tr><td>IT</td><td>1,895</td><td>1,269</td><td>5,372</td><td>1,410</td><td>2,745</td><td>816</td></tr>
<tr><td colspan="7">Digital Media 38%, Appliance: 29%, Information and telecommunication: 33%
Export: 78%, Domestic demand: 22%</td></tr>
<tr><td>Cost</td><td colspan="7">Raw material: 82.2%, Labor: 5.3%, other cost: 12.3%</td></tr>
<tr><td>Brand</td><td colspan="7">Cyon</td></tr>
<tr><td>Sales Channel</td><td colspan="7">Domestic: through agents or mobile phone service companies
Export: through oversea subsidiaries, branch offices or directly</td></tr>
<tr><td rowspan="10">Financial status
(unit: $ million USD)</td><td></td><td colspan="2">2002</td><td colspan="2">2003</td><td colspan="2">2004. 9</td></tr>
<tr><td>Sales amount</td><td colspan="2">12,640</td><td colspan="2">18,341</td><td colspan="2">16,488</td></tr>
<tr><td>Operating revenues</td><td colspan="2">600</td><td colspan="2">965</td><td colspan="2">1,049</td></tr>
<tr><td>Net income</td><td colspan="2">251</td><td colspan="2">601</td><td colspan="2">1,256</td></tr>
<tr><td>Debt ratio</td><td colspan="2">237%</td><td colspan="2">221%</td><td colspan="2">175%</td></tr>
<tr><td>Cash from operating</td><td colspan="2">1,370</td><td colspan="2">822</td><td colspan="2">1,189</td></tr>
<tr><td>Liquidity ratio</td><td colspan="2">63%</td><td colspan="2">74%</td><td colspan="2">89%</td></tr>
<tr><td>Retained earnings</td><td colspan="2">251</td><td colspan="2">696</td><td colspan="2">1,723</td></tr>
<tr><td colspan="7">In 2002, the scale of sales amount and net income decreased because of deconsolidation of the business, but from 2003, LG electronics gained growth due to the growing sales of digital appliance products and mobile phones. LG is inferior to its domestic competitor, Samsung Electronics in debt ratio or liquidity, but this is an insignificant problem for LG since it has relatively high quality technologies and marketing capabilities.</td></tr>
<tr><td>Prospect</td><td colspan="7">Despite the domestic economic depression in 2004, it is expected that LG will remain at a level of about 20% market share but possibly threatened by Pantech & Curitel penetrating LGE's market share</td></tr>
<tr><td>Website / TEL</td><td colspan="7">www.lge.co.kr / 02-3777-1114</td></tr>
</table>

< Information of Main Enterprises >

[Chart Ⅱ-12]

Company	Pantech&Curitel					
History / Ownership	1983 Established as a communication business sector of Hyundai Electronics 2001 Divided into Hyundaicuritel, bought mobile phone business sector from Hynix, Pantech gained ownership by stock purchase 1st stockholder: The president of Pantech (25%) 2nd stockholder: Pantech Capital (4%)					
Sales (unit: $ million USD)		2002		2003		2004	
		Export	Domestic	Export	Domestic	Export	Domestic
	CDMA	390	100	678	441	745	445
	GSM	28	-	40	-	8	-
	CDMA450	17	-	44	-	9	-
	WLL	25	-	19	-	4	-
	Export/domestic demand ratio (2004.9): Export 63%, Domestic 37% Sales portion: CDMA 98%, Others 2%						
Cost	Raw material: 83%, Labor: 2%, Others: 15%						
Brand	Curitel (the former Gulliver, Neomi)						
Sales Channel	Export: Mainly indirectly through oversea distributors -North, Middle East, and South America: distribution right of CDMA product is given to AudioVox. -China: Distributed to the local buyers with ODM type (except CDMA450 and WLL) -Others: Distributed as oversea buyers' brand Domestic demand: sell through mobile telecommunication service company						
Financial status (Unit: $ million USD)		2001	2002	2003	2004. 9		
	Sales amount	512	663	1,259	1,356		
	Operating revenues	35	40	61	47		
	Net income	12	39	37	35		
	Debt ratio	321	149	151	147		
	Cash from operating	133	51	16	24		
	Liquidity ratio	134	105	117	129		
	Retained earnings	13	52	90	127		
	Since 2003, the sales amount grew abruptly by its active marketing strategy. However, owing to the high rate of loan portion in gross debt (50%), its stability level is weak. But its earnings are enough to cover these fixed costs because of increasing oversea export.						
Prospect	After Pantech took over the company in 2001, its organization was effectively restructured to rise up as the third largest domestic company. Because it sells most of its products to the oversea market, domestic sales portion is relatively low. But in the camera mobile phone sector, it marked second in domestic market following Samsung Electronics. It is expected to increase its market share through its increased brand awareness						
Website / TEL	www.curitel.com / 02-580-5007						

< Other Companies >

[Chart Ⅱ-13]

Company	Past & Present
Appeal Telecom	- Equity securities (51%) bought by Motorola Korea in 1988 - Domestic market share: 2% (CDMA manufacturing company) - Merged by Motorola Korea in 2004 - Sales 2003: USD $443 million (export: 56%, domestic: 44%) Net profit: USD $1.8 million, Asset: USD $220 million, Debt-equity ratio: 52% - Website/Tel: www.mymotorola.co.kr / 02-3440-7000
SK Teletech	- Established in 1998 as an affiliate of SK Telecom - Performs R&D, Manufactured by SKC - Export: 38%, Domestic: 62% - Sales 2003: USD $1.8 million, Asset: USD $333 million,Debt-equity ratio: 118% - Retains 118 A/S agencies - Brand: SKY - Total employees: 577 (researchers: 387) - Website/Tel: www.skteletec.co.kr / 1588-9111
Pantech	1991: Established as Pantech Co., Ltd 1992: Began domestic sales and export of wireless pagers 1997: Launched production of CDMA phone 1998: Signed the agreement for the investment and OEM with Motorola 2001: Acquired Pantech &Curitel 2003: Joint venture with Daxian, China to product GSM - Main products: CDMA: 53%, GSM: 47% (export: 86%, domestic: 14%) - Domestic: Motorola Korea -> Distribution-> Customer Pantech & Curitel-> Customer - Export: CDMA-> Motorola Global -> Distribution-> Customer GSM-> Production of GSM phones in China-> Distribution->Customer - Main stockholders: Park Byeong Yeop (major shareholder of Pantech, 20%), Motorola (16%), Pantech & Curitel (6%) - Financial status: sales USD $601 million / Net Income USD $14 million Debt-equity ratio: 118% / Current ratio: 112% In 1998, the company secured products for long-term export through the foundation of equity investment by Motorola. And in late 2001, it established a bridgehead in the domestic market by undertaking Curitel. Although Motorola is a second major stockholder, Pantech can exclusively exercise the right of management owing to its affiliated company. Recently export is growing in Europe and South America, but declining in China due to the deepened competition. Although the majority of the export volume is supplied to Motorola as ODM, it has recently grown export sales with its own brand. Pantech & Curitel is one of its main buyers. Website / Tel: www.pantech.co.kr / 02-782-9456

Company	Past & Present
Motorola Korea	- Established as Motorola Korea Co, Ltd in 1992 /Focused on product sales - Marketed mobile phones manufactured by Pantech and Appeal Telecom - Acquired Appeal Telecom in 2004 - Mobile phone supplier of SK Telecom (Startech, Spinmoto) - 2003.12 Sales Amount: USD $261 million, Net Loss USD $-34 million - Website /Tel : www.mymotorola.co.kr / 02-3440-7000
Sewon Telecom	- Established in 1988 - Supplier of LG Telecom and KTF with CDMA mobile phone - Export: 87%, Domestic: 13% - CDMA: 7%, GSM: 93% - Under the order of the Court, disposed CDMA Dept. in 2004. - Sales on Sept 2004: USD $84 million / Net profit: USD $-210 million - Subsidiaries: Maxon Telecom (Specializes on GMS, sales: USD $118 million / Net profit: USD $-28 million) - Website /Tel: www.sewon-tele.co.kr / 080-600-0030 - Mainly exports phones to China. - Mainly exports to Chinese local manufacturer. In 2003, financial status got worse, showing a heavy loss because of downturn in China.

Prospects

In the aspect of market growth, the domestic mobile phone market is going through a period of transition to enter the 3rd generation of mobile communication services. Therefore, the present demand of mobile phone shows that more new models will replace the old ones and big growth is not expected due to the saturated market. But from 2005, when the 3rd generation service will be invested in full scale, mobile phone market is anticipated to achieve high growth once again.

On the competitiveness of market, the market share of Samsung Electronics and LG Electronics was 72% in 2002, and has increased to 75% in 2003. In 2004, it appears that Samsung – having competitive technologies and the dominant position in volume and marketing ability – and LG will gradually take more market share. Meanwhile, Pantech & Curitel is expected to close in to the second place in market share based on the strength of its camera phones and active marketing.

Motorola and other middle standing and new enterprises are fighting for the remainder of the market share. Recently, Motorola Korea took over Appeal Telecom, ranked 5th in the Korean market share, thus they are anticipated to increase their market share in Korea. Consequently, market share for the remaining small or medium sized companies are expected to lessen in the domestic market and increase in export portion.

Recently, a foreign Mobile phone company established an R&D center in Korea by acquisition of a Korean company. There were other successful M&As such as Appeal Telecom with Motorola and CDMA R&D department of Gigatelecom with UTIStarcom. Taiwanese and Chinese industries are showing interest in the market and technology by merging with just the R&D departments of Telson Electronics and Maxon Telecom which recently went bankrupt. This is so that they can manufacture the products in the country where the wages are low and develop technologies in Korea to expand their international market share. These trends seem insignificant in the short term but in the long run it'll be domestic technology competing in the domestic market.

In 2005, middle standing or small/medium-sized companies are expected to be liquidated and only a few competitive companies will remain in the market.

3. Equipment Market (Market of Repeaters)

The Characteristics of Market

Most repeater suppliers in Korea are small/medium sized enterprises and they don't have the capacity to supply their products to more than two mobile communication companies. Although mobile communication companies want to diversify their suppliers, the suppliers' volume of products and personnel for After-Service cannot support their customers. So, realistically, they cannot change their counterparts easily.

For this reason, mobile phone service companies select their own suppliers and require exclusive supply so they can access stable supply, technical supports, and continuous A/S. It is inevitable to develop mutual cooperation with repeater industries since by nature the repeaters must be built in a short-term period as is with the business plan. Hence, the future repeater industry will be reorganized with a small number of the fittest enterprises that can supply stable products and carry out continuous R&D.

Major Enterprises

Since early 2000, mobile phone service enterprises are converging. And as the number of companies decrease, the gap between the sales of enterprises having better price and technologies and those who don't have widened. It resulted in only a few suppliers claiming the majority of profits, and making it difficult for the late starters to set stride in the new market. To survive in this saturated equipment market, product diversification has become a must.

The number of companies who joined the repeater industry has increased to 60 from 10 during the early 1990s. But the number of companies with the ability to develop independently is only about 10. And there are only a few foreign corporations present here in the Korean market. Most suppliers supply their products to SK Telecom, KTF, LG Telecom, or other mobile companies with fixed transaction relationships. Average sales of the six major suppliers in the domestic market is near 95%, which means that most repeater companies rely on domestic buyers.

< Major Domestic Repeater Companies >

[Chart Ⅱ-14] (2004. 9) (Unit: $ 1,000 USD/%)

Company	*Sales	Operating profit	Debt-equity ratio	Domestic market share	Sales of repeater/ total sales	Main customers
Kisan Telecom	27,285	5,606	25%	95%	77%	SKT, KTF
Youngwoo communication	19,124	4,647	20%	83%	56%	KTF
(Eastelsystems Former:Sungmi Electronics)	14,800	-966	170%	100%	58%	SKT KTF
Danam	6,650	2,334	427%	100%	11%	KTF
Withus	5,427	-1,036	100%	95%	92%	KTF
Samji Electronics	5,031	689	9%	100%	22%	LGT
Hantel	2,151	2,071	109%	96%	18%	LGT

* Sales of Repeaters only

Company	Details	Location/Website/Tel
Kisan Telecom	- One of the biggest domestic CDMA repeater manufacturers. Additionally produces fiber optic transceiver, Echo Canceller, and VoIP - Achieved external growth by Phone Number Portability System. - Sound financial structure from operating income, insignificant liabilities, and guaranteed liquid fund.	Seoul/ www.kisantel.co.kr / 02-3433-8200
Youngwoo Communication	- Manufacturer specialized in repeaters and keypads of cellular phones - Continuous growth due to the increasing demand for repeaters and sales increases. - Stable financial structure and fine cash flow with zero liability	Kyung-Ki/ www.ywtc.com / 031-703-7118
Eastelsystems	- Cable transmission equipments and repeater manufacturer - Subsidiary of Dongwon Enterprise - Sudden decrease of volume due to the of sales decline of repeaters and cable transmission equipments since 2001 - Aggravated profitability for the large amount of selling and administrative expenses (development expense, license, etc.) and unstable financial structure - Expected support from Dongwon Enterprise	Kyung-Ki / www.eastelsystems.com / 031-467-7000
Danam	- Primarily supplied Power Supply for PDP to Samsung SDI and repeaters to KTF - Growth has been improved by stable sales of Power Supply for PDP and the increased demands on repeaters but because of the enormous liabilities the cash flow worsened	Kyung-Ki / www.danam.co.kr / 031-428-2061
Withus	- Repeater manufacturer mainly supplied to KTF - Constant operating loss due to the decreasing demands for repeaters since 2002	Kyung-Ki / www.danam.co.kr / 031-428-2061

Company	Details	Location/Website/Tel
Samji Electronics	- Repeater manufacturer mainly suppling to LG Telecom - Made contract with LG for developing repeaters - Manufactured industry-use PDA and instrument panels for Renault Samsung Motors	Seoul /www.samji.com 02-850-8000
Hantel	- Exports pagers, has achieved 40% of market share in the United States - About 18% of sales is from repeaters and supplied mainly to LG Telecom - External growth is expected due to the increased demand for wireless terminal exports	Kyung-Ki / www.han-tel.co.kr / 031-777-2300

Prospects

In 2004, latecomers such as KTF, LG Telecom and other service providers are trying to increase their number of subscribers by taking advantage of the Phone Number Portability System – a new policy introduced this year. And these providers are looking to repeaters to meet the service demand rather than to costly base stations – which calls for short-term increase in the repeater market.

In the long-term, services such as IMT-2000, Satellite DMB and wireless Internet communication will prevail in the market, thus it calls for another cycle of strong demands for repeaters. Companies with strong bases in technology and financial structure will once again gain market competitiveness.

Although the repeater market depends on domestic sales, big companies like Samsung Electronics and LG Electronics will begin its CDMA network development in Southeast Asia including Indonesia. Therefore, it is likely that previous repeater suppliers to these companies will join the development going on in these new markets bringing further growth prospect.

ANALYSIS OF KOREA'S MOBILE COMMUNICATION INDUSTRY

RESTRICTIONS AND SUPPORTS BY THE GOVERNMENT

1. Restrictions

Mobile Communication: Service

"The Information and Communication Promotion Office" – which is under the branch of the Ministry of Information and Communication – is responsible for the restrictions on mobile phone industries. They oversee works relating to authorizing establishments, service charges, sharing network lines, M&As and other legal authorizations until the suspension or liquidation of businesses. However, due to the amendment of Electric Communication Business Act, the Communication Committee now takes the responsibility of executing the final rulings such as imposing penalties and determining business suspension.

Legal Basis

Electric Communication Business Act

Article 5: The mobile phone service is a business that must be admitted by the Minister of Information and Communication Department and this business sector is not opened to foreign corporations.

Electric Communication Business Entity Act

Article 6: There is a limitation for foreign governments and corporations' in ownership of domestic mobile phone companies (about 49%). If it does exceed the limitation then they do not have the voting rights for the excess portion of the equity limitation and will receive orders to rectify and penalty will be imposed.

Enforcement of Electric Communication Business Act

If unfair actions are discovered on the contract regarding the rate and subscription, the Communication Committee will impose penalies and temporarily suspend the business.

Mobile Communication: Mobile Phone/Equipments

In the case of the domestic market, business can be done without any restrictions if the business satisfies the criteria and tests for compatibility with the national mobile communication enterprises, basic A/S, and standards of quality. As for the export market, the test for compatibility with other countries' mobile communication enterprises and basic A/S must be met to do business in Korea.

2. Supports

Information Promotion Act

The Ministry of Information and Communication provides financial support for the R&D and infrastructure development on Information Communication and developing human resources with the fund prepared by the government and related providers.

Article 33: The government enacts promotion fund to promote and support information society.

Article 34: The fund is composed of allotments from the government and contributions from the communication companies. This fund will be used to develop high-speed information communication infrastructure, R&D on information and communication, support education programs to develop human resources for information and communication technologies.

Article 35: The Minister of Information and Communication carries out the use and management of the fund and the minister may entrust related organizations and associations with the fund.

The Law on Developing Fundamental Basis of Industrial Technologies

The Ministry of Commerce, Industry and Energy supports companies developing new technologies with financial support for those qualified against certain criteria.

COMPARISON WITH INTERNATIONAL MOBILE COMMUNICATION INDUSTRY

The Growth of Industry

Gartner Dataquest forecasts an annual worldwide growth rate of 5.5% for the mobile phone market until 2008. Their figures show that markets in Asia, North America, and the Middle East, which have low rates of mobile phone distribution per population, is expected to grow steadily hauling the demands of the international market. The market in Western Europe is slowing down and only small growth is expected due to the saturation of subscribers.

< Forecast of World Mobile Phone Market Growth >

[Chart Ⅳ-1] (Unit:1,000)

Area	2003	2004	2005	2006	2007	2008	Annual growth rate
Africa	13,210	17,145	20,307	23,811	27,771	31,253	16.2%
Asia	181,237	215,198	241,141	265,911	287,896	307,537	9.3%
Middle/ East Europe	44,466	51,454	46,282	41,027	38,432	40,274	-5.9%
Middle South America	38,453	60,941	66,286	68,558	69,489	71,110	3.9%
Middle East	12,327	14,908	16,461	18,544	20,155	22,140	10.4%
North America	108,074	121,488	131,204	140,410	146,234	150,867	5.6%
Total	519,989	616,421	659,871	694,350	728,700	762,798	5.5%

(Source : Gartner Dataquest 2004. 10.)

Mobile Phone Market of North America

Till 2008, the market anticipates an annual growth rate of 5.6%, with about 150million mobile phones supplied to the market in 2008. The Distribution rate of mobile phones is lower than that of Western Europe, so it is expected to grow more in the future. According to another market researcher – Strategy Analytics – about 195 million users are expected to subscribe by the end of 2004. The demand for CDMA Mobile phones, which is included in that figure is forecasted at 90 million (46%). By the end of 2007, around 252 million of users are expected, and CDMA mobile handset users are expected to reach 126 million (52%). CDMA mobile phones are expecting steady strong growth in North America for the time being.

Western European Market

Because the average rate of mobile phone distribution is very high, the saturated subscribers market is showing slow growth. Slow growth, at a rate of about 0.8% per year, is forecasted until 2008. The majority of mobile phones in Europe are GSM type.

Chinese Market

The number of subscribers in China is expected to reach 260 million in 2003. And with the anticipated growth rate of 17% per year from 2002 to 2006, the number of subscribers is expected to reach about 380 million, and the distribution rate 29% in 2006.

The mobile phone market is anticipated to grow 14% per year until 2006 and about 81 million sets of mobile phones are expected to be sold in China in 2006. GSM mobile phones have led the Chinese mobile handset market, and CDMA2000 1x mobile phones have joined the mobile handset market since 2003. However, the market share of GSM is 80%, and it is anticipated to be dominant in the future market.

< Forecast of Mobile Phone Service Users and Sales in China >

[Chart Ⅳ-2] (Unit: 10,000persons/ USD/ %)

	2002	2003	2004	2005	2006
Subscribers	20,662	25,968	30,673	34,813	38,423
Growth rate	42.7	25.7	18.1	13.5	10.4
Distribution rate	16.0	19.9	23.3	26.2	28.7
Sales	22,934	25,764	26,916	27,525	28,092
Growth rate	21.4	12.3	4.5	2.3	2.1

(Source: Gartner Dataquest 2003.4 Note: $1 USD = 9 CNY)

< Forecast of Mobile Phone Handset Sales in China >

[Chart Ⅳ-3] (Unit: 10,000/ %)

Details		2002	2003	2004	2005	2006
GSM	Sales volume	48,778	47,910	52,299	62,508	67,836
	Market share	99.5%	87.7%	84.1%	84.5%	82.9%
CDMA	Sales volume	245	6,719	9,888	11,466	13,911
	Market share	0.5%	12.3%	15.9%	15.5%	17.1%
Total		49,023	54,629	62,187	73,974	81,830

ANALYSIS OF KOREA'S MOBILE COMMUNICATION INDUSTRY

GLOSSARY

···› CDMA

Short for Code-Division Multiple Access, CDMA is a digital cellular technology that uses spread-spectrum techniques. Unlike competing systems, such as GSM, that use TDMA, CDMA does not assign a specific frequency to each user. Instead, every channel uses the full available spectrum. Individual conversations are encoded with a pseudo-random digital sequence.

CDMA is a military technology first used during World War II by the English allies to foil German attempts at jamming transmissions. The allies decided to transmit over several frequencies, instead of one, making it difficult for the Germans to pick up the complete signal.

Because Qualcomm Inc. created communications chips for CDMA technology, it was privy to the classified information. Once the information became public, Qualcomm claimed patents on the technology and became the first to commercialize it.
(Source: Webopedia Computer Dictionary)

···› PCS (Personal Communications Service)

Short for personal communications service, the U.S. Federal Communications Commission (FCC) term used to describe a set of digital cellular technologies being deployed in the U.S. Also referred to as digital cellular, PCS works over CDMA (also called IS-95), GSM, and North American TDMA (also called IS-136) air interfaces.

Three of the most important distinguishing features of PCS systems are:
- They are completely digital
- They operate at the 1900MHz frequency range (unlike other cellular systems that operate in the 800MHz frequency range)
- They can be used internationally

PCS is a second-generation mobile communications technology.
(Source: Webopedia Computer Dictionary)

···› IMT-2000

IMT-2000 (International Mobile Telecommunications-2000) is the global standard for third generation (3G) wireless communications as defined by the International Telecommunication Union(ITU).

···› WCDMA

Short for wideband CDMA, WCDMA is a high-speed 3G mobile wireless technology with the capacity to offer higher

data speeds than CDMA. WCDMA can reach speeds of up to 2 Mbps for voice, video, data and image transmission. WCDMA was adopted as a standard by the ITU under the name "IMT-2000 direct spread."
(Source: Webopedia Computer Dictionary)

···› Mobile Phone Number Portability System

The new system allows mobile phone subscribers to keep their telephone number when switching providers by comparing service quality and rates in the utility market.

The guidelines that have been finalized by the Telecommunication Committee are focused on providing greater convenience to subscribers. For example, it calls for providing one-stop service for application for and registration of a new number.

Accordingly, subscribers of cellular phone services will be able to switch to a different carrier while retaining their phone numbers when asking for a new carrier.

···› 3G

3G is an ITU specification for the third generation (analog cellular was the first generation, digital PCS the second) of mobile communications technology. 3G promises increased bandwidth, up to 384 Kbps when a device is stationary or moving at pedestrian speed, 128 Kbps in a car, and 2 Mbps in fixed applications. 3G will work over wireless air interfaces such as GSM, TDMA, and CDMA. The new EDGE air interface has been developed specifically to meet the bandwidth needs of 3G.
(Source: Webopedia Computer Dictionary)

···› WiBro

WiBro, first developed by Korea, is a portable Internet service that provides high-speed wireless Internet connection anytime anywhere, whether the user is on the move or at a standstill.

It operates in the range of 2.3Ghz frequency bandwidth, and is designed to provide a 1Mbps Internet connection to receiver devices moving at speeds up to 70 kilometers per hour.

···› DMB (Digital Multimedia Broadcasting)

DMB refers to mobility-specific services capable of providing high quality audio and video

contents. DMB service delivers diverse contents encompassing music, text or video clips to mobile or fixed terminals including mobile phones, PDA or portable TV.

DMB does not simply mean a beginning of new broadcasting service. In the long run, DMB is expected to evolve into a universal service and have an immense influence over other industries engaged in terminal and part production or contents development. Commercial DMB service is yet to be launched.
(Source: Korea Times)

···› Repeater

The repeater is a network device used to regenerate or replicate a signal. Repeaters are used in transmission systems to regenerate analog or digital signals distorted by transmission loss. Analog repeaters frequently can only amplify the signal while digital repeaters can reconstruct a signal to near its original quality.

In a data network, a repeater can relay messages between subnetworks that use different protocols or cable types. Hubs can operate as repeaters by relaying messages to all connected computers. A repeater cannot do the intelligent routing performed by bridges and routers.
(Source: Webopedia Computer Dictionary)

···› Telematics

Telematics refers to the broad industry related to using computers in concert with telecommunications systems. This includes dial-up service to the Internet as well as all types of networks that rely on a telecommunications system to transport data.

The term has evolved to refer to systems used in automobiles that combine wireless communication with GPS tracking. The term is further evolving to include a wide range of telecommunication functions that originate or end inside automobiles.
(Source: Webopedia Computer Dictionary)

ANALYSIS OF KOREA'S MOBILE COMMUNICATION INDUSTRY

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The strengths of Korea's mobile phone market can be summarized as the following: world class mobile communications infrastructure, leadership position in the CDMA business, and the presence of diverse content developers.

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