

UIC John Marshall Journal of Information Technology & Privacy Law

Volume 20
Issue 3 *Journal of Computer & Information Law*
- Spring 2002

Article 3

Spring 2002

E-Korean DSL Policy: Implications for the United States, 20 J. Marshall J. Computer & Info. L. 417 (2002)

Junseong An

Follow this and additional works at: <https://repository.law.uic.edu/jitpl>



Part of the [Computer Law Commons](#), [Internet Law Commons](#), [Privacy Law Commons](#), and the [Science and Technology Law Commons](#)

Recommended Citation

Junseong An, E-Korean DSL Policy: Implications for the United States, 20 J. Marshall J. Computer & Info. L. 417 (2002)

<https://repository.law.uic.edu/jitpl/vol20/iss3/3>

This Article is brought to you for free and open access by UIC Law Open Access Repository. It has been accepted for inclusion in UIC John Marshall Journal of Information Technology & Privacy Law by an authorized administrator of UIC Law Open Access Repository. For more information, please contact repository@jmls.edu.

E-KOREAN DSL POLICY: IMPLICATIONS FOR THE UNITED STATES

JUNSEONG AN†

I. INTRODUCTION

On October 29, 2001, the Organization for Economic Cooperation and Development (“OECD”)¹ released the study “The Development of Broadband Access in OECD Countries.”² The report released early figures for broadband penetration: both DSL³ and cable modem,⁴ and

† Junseong An is a candidate for M.A. Telecommunications programs at George Washington University in Washington, D.C. In June 2000, An received his LL.M. degree in Information Technology & Privacy Law from the John Marshall Law School in Chicago. The Author dedicates this article to his parents in South Korea. Special thanks to Dr. Christopher H. Sterling, Breck Blalock, Kelly Cameron, Diane Cornell, Richard Engelman, Donald Friedman, David Hilliard, William K. Keane, Jungsam Kim, Scott Marcus, Larry Olson, Taehyun Park, and Tony Rutkowski.

1. The official website is available at <<http://www.oecd.org>> (assessed Oct. 22, 2002).

2. Sam Paltridge, *The Development of Broadband Access in OECD Countries* <<http://www.oecd.org/pdf/M00020000/M00020255.pdf>> (accessed Oct. 29, 2001).

3. TechWeb: The Business Technology Network, *TechEncyclopedia* DSL ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=dsl&x=20&y=8>> (accessed Aug. 25, 2002) [hereinafter *TechEncyclopedia*]. Digital Subscriber Line (DSL) refers to a technology that significantly increases the digital capacity of ordinary telephone lines into the home or office. *Id.* DSL speeds are related to the distance between the customer and the Telco central office. *Id.* There are two types of usage. *Id.* First, Asymmetric DSL (ADSL) is used for Internet access, and while fast downstream is required, slow upstream is acceptable. *Id.* Symmetric DSL (SDSL, HDSL, etc.) is intended for short haul connections which require high speed in both directions. *Id.* Distinct from the ISDN, which is also digital but travels through the switched telephone network, DSL offer an “always-on” operation. *Id.* At the Telco central office, DSL traffic is aggregated in a unit called the DSL Access Multiplexor (DSLAM). *Id.* This unit is then forwarded to the appropriate ISP or data network. *Id.*

4. In addition to the rapid DSL deployment, South Korea also has a remarkable growth of cable modem service. On February 28, 1980, Korea Electric Power Company (KEPCO) launched the first fiber network in South Korea. On May 1, 1995, KEPCO also launched the first cable TV network service, which was forty-seven years later than the U.S. Whereas in many foreign markets including the U.S., former local cable monopolies have jealously guarded their fiber-optic networks from competitors, PowerComm, a subsidiary of KEPCO, started Multiple-ISP (M-ISP) service in July 1998, which enables telecom

gathered background information regarding economic growth indicators in its member countries.⁵ The study also included two interesting facts. First, despite cross-governmental efforts⁶ to deploy broadband in their respective countries, the total broadband penetration rate is only 1.96 subscribers per one hundred inhabitants,⁷ which does not yet make it a significant economic indicator. Second, South⁸ Korea⁹ is the most developed¹⁰ country in terms of broadband penetration and coverage rate¹¹ among its thirty member countries since year 2000.¹² (See Table 1)

According to the study, the top five countries, in order of penetration rate, were South Korea, Canada, Sweden, United States, and the Netherlands.¹³ (See Table 1) In terms of household broadband access to the Internet, South Korea is by far the leading performer in the OECD area.¹⁴ South Korea's broadband penetration was 13.91 subscribers per one hundred inhabitants, which is more than double the penetration of Canada, the next best performing country. The OECD report concluded that South Korea's explosive growth rate was due to intense competition and a strong government broadband policy.¹⁵ This paper will discuss the

companies to provide telecom services without their own networks. Broadband access providers, including Thrunet, were able to lease these lines cheaply and roll out their own services.

5. OECD, *OECD Member Countries* <<http://www.oecd.org/oecd/pages/document/displaywithoutnav/0,3376,EN-document-notheme-1-no-no-9464-0,00.html>> (accessed Aug. 6, 2002) (stating that Korea joined the OECD as a member country on December 12, 1996).

6. Paltridge, *supra* n. 2, at 11 (stating that at the end of 2000, commercial DSL services were available in twenty-two of the thirty OECD countries).

7. *Id.* at 14.

8. Another growing IT market for South Korea is its immediate but estranged neighbor above the 248 km Demilitarized Line (DML): North Korea. Recently, several IT joint ventures between South and North Korea have been set up including television and automobile industries. However, many questions still remain unsolved due to its geo-political situs and time-consuming technical standardization process.

9. CIA World Fact Book 2001, *South Korean* § Geography <<http://www.cia.gov/cia/publications/factbook/geos/ks.html>> (accessed Aug. 6, 2002) (comparing the area of South Korea to the size of Indiana). However, its population amounts to one-sixth of the 2001 estimated population of the U.S. *Id.* at § United States.

10. Paltridge, *supra* n. 2, at 13-14 (showing South Korea's new DSL subscriber number is almost twice of the total DSL subscriber number in the fifteen EU member countries in 2001).

11. *Id.* at 11.

12. *Id.* at 14.

13. *Id.*

14. *Id.* at 32.

15. *Id.* at 32-33. South Korea's impressive broadband story began about five years ago when the government issued a policy mandating that operators provide a 2-Mbps connection for every citizen. *Id.* This broadband policy, combined with a competitive domestic telecom market and a densely populated and computer literate society, incubated Korea's burgeoning broadband services. *Id.*

underlying factors of the successful DSL deployment in the case of South Korea and its implications for the United States.

A. SOUTH KOREAN DSL MARKET

Broadband development in the OECD area is clearly uneven. Available technologies, regulations, and penetration rates vary across the member countries, making it impossible to make any generalization. However, by any standard, South Korea stands alone in terms of its broadband deployment: South Korea is the world leader in broadband use and, unsurprisingly, the leader in terms of regulatory development.¹⁶ (See Appendix A)

In Seoul, more than eighty percent of new apartment buildings are designed with built-in fiber conduits,¹⁷ in preparation for what South Koreans regard as a future lifestyle: Fiber-To-The-Home ("FTTH").¹⁸ This high-speed networking trend is not surprising, considering the fact that the total number of newly installed broadband lines in South Korea exceeded that of the twenty-nine remaining OECD member countries in 2001.¹⁹

The fact that South Korea's dense, urban population²⁰ is mainly housed in Multi-Dwelling Units ("MDUs")²¹ makes the country ripe for high broadband penetration, because network installations are relatively

16. Ministry of Information & Communications, *Information & Communications White Paper 2001* Ch. 2, at 15 <<http://www.mic.go.kr/eng/jsp/res/2001chapter2.pdf>> (accessed Oct. 24, 2002).

To create and maintain adequate laws and a system environment for a knowledge-based society, every year the South Korean government projects to research and study the laws and systems related to information and communication. Up to June 2001, the total number of 158 ordinances have been enacted and revised: 79 ordinances related to information and communication in the public sector and 79 ordinances related to creating and promoting a positive environment for information and communication in the private sector.

Id.

17. Kim Hoo-Ran, *Wired Apartments Bring Information Age Home* ¶ 5 <http://www.koreaherald.co.kr/SITE/data/html_dir/1999/12/15/199912150027.asp> (last updated Dec. 15, 1999).

18. International Engineering Consortium, *Fiber To The Home* § Definition and Overview <http://www.iec.org/online/tutorials/fiber_home/> (accessed Aug. 6, 2002) (defining Fiber to the Home (FTTH) as the installation of optical fiber from the carrier directly into the home or office).

19. Paltridge, *supra* n. 2, at 13-14.

20. There are also gaps emerging among OECD member countries in the deployment of asymmetric DSL (ADSL) and cable modem.

21. *TechEncyclopedia*, *supra* n. 3, at MDU ¶ 1 <<http://www.techweb.comencyclopedia/defineterm?term=mdu>> (accessed Aug. 8, 2002). Multiple Dwelling Unit (MDU) is defined as a commercial or residential building with multiple offices or apartments. *Id.* The term is used when referring to in-house networks that support multiple tenants. *Id.* ISPs and carriers increasingly offer specialized systems for such facilities. *Id.*

easier and cheaper due to the increased economies of scale. Operators in South Korea serve MDUs by installing DSL Access Multiplexers ("DSLAMs")²² in basements,²³ which make it convenient to add new customers in the building and minimize distance constraints.²⁴ South Korean operators are in ready²⁵ position to upgrade to future services such as very-high bit rate DSL ("VDSL")²⁶ and even Wavelength Division Multiplexing ("WDM").²⁷

According to a recent press release by NetValue,²⁸ South Korea has more than twenty-four million Internet users and 57.3 percent of the country's household use broadband access,²⁹ which is five times more than its United States counterpart.³⁰ In addition, NetValue found that the South Korean Internet users are the most active³¹ in the world, us-

22. *TechEncyclopedia*, *supra* n. 3, at DSLAM ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=dslam>> (accessed Aug. 8, 2002). DSL Access Multiplexor (DSLAM) is defined as a central office (CO) device for ADSL service that intermixes voice traffic and DSL traffic onto a customer's DSL line. *Id.* Additionally, it breaks up the incoming phone and data signals and directs them onto the appropriate carrier's network. *Id.*

23. Normally, the DSLAMs are installed at the central office. However, the MDUs in South Korea have DSLAMs installed at their respective basements, which significantly decrease the distance from the end users.

24. Paltridge, *supra* n. 2, at 9. Due to its physical distance constraints, the current ADSL service can only be provided within 5.5 km radius from the central office. *Id.*

25. Hanaro Telcom, Inc., *Service Information § Vision 2001* <<http://www.hanaro.com/english/>> (accessed Aug. 8, 2002) (showing Hanaro Telecom has deployed Fiber-To-The-Curb (FTTC) in much of its coverage area in its projection figure).

26. *TechEncyclopedia*, *supra* n. 3, at § VDSL. Very High Bit Rate DSL (VDSL) is defined as an asymmetric version of DSL. *Id.* It is used as the final drop from a fiber optic junction point to adjoining customers. *Id.* VDSL allows an apartment or office complex to obtain high-bandwidth services using existing copper wires without the need of replacing the infrastructure with optical fiber. *Id.* Similar to the ADSL, VDSL can share the line with the telephone. *Id.*

27. *TechEncyclopedia*, *supra* n. 3, at WDM ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=wdm>> (accessed Aug. 8, 2002). Wavelength Division Multiplexing (WDM) refers to a technology that uses multiple lasers and transmits a number of wavelengths of light (lambdas) concurrently over a single optical fiber. *Id.* Each signal travels within its own color band, which is modulated by the data. *Id.* WDM permits the existing fiber infrastructure of the telephone companies and other carriers to be increased dramatically. *Id.* Certain WDM systems can support more than 150 wavelengths, each carrying up to 10 Gbps. *Id.*

28. NetValue Worldwide, *About Us § The Company* <<http://www.netvalue.com/>> (accessed Aug. 8, 2002) (chronicling NetValue as a French-based Internet research firm with a U.S. subsidiary).

29. NetValue Asia, *Korea Leads World in Broadband Usage* <http://kr.netvalue.com/presse_hk/cp0022.htm> (last updated Apr. 2, 2001).

30. *Id.*

31. NetValue Asia, *Korea Boasts the Highest E-Commerce Site Usage in the World but the Actual Purchase Rate is Low* ¶ 4 <http://kr.netvalue.com/presse_hk/cp0030.htm> (last updated June. 28, 2001) (reporting South Korea grabbed the top position in the world in terms of e-commerce site access with 78.2% of its Internet users visiting e-commerce site).

ing an average of nineteen hours per month, which is almost double than the average use in the United States.³² (See Table 2)

B. KOREA INFORMATION INFRASTRUCTURE ("KII")

In 1993, in order to keep up with the global trend of "Information Super-highway," the South Korean government first introduced an initial plan for Korea Information Infrastructure ("KII").³³ In March 1995, the government established a Comprehensive National Plan ("CNP")³⁴ for KII in three different phases.³⁵

The national plan has three distinct components: KII-Government ("KII-G"), KII-Test bed ("KII-T"), and Public Funding Program ("KII-P"). The key point of the policy is that the government positions itself as a technology champion and combines large-scale public funding with governmental guidance³⁶ of private market: the underlying idea of CNP is that the government sees broadband as critical to future international competitiveness.³⁷

In December 2000,³⁸ with the government investment of \$437 mil-

32. *Id.* at ¶ 1.

33. The main goal for KII was to construct nationwide information infrastructure to exchange real time video ubiquitously. Its plan was revised twice according to the technology development and market share. In 2000, the KII plan is to be completed in 2005 with the total investment of \$30 billion.

34. *National Informatization White Paper 2001*, 377 (Korean ed., NCA 2001) (translation on file with author) [hereinafter *National Informatization White Paper*].

35. *Id.* at 377. KII has three different phrases: Phrase I (1995-1997), Phrase II (1998-2000), and Phrase III (2001-2005); see also US Internet Council, *Korea Information Infrastructure (KII) & Broadband Service* ¶ 1 <<http://www.usic.org/pressreleases/kii.htm>> (accessed Aug. 8, 2002) (describing that the first stage was completed in 1997 and the second stage was completed in 2000).

36. As its first step, the South Korean National Assembly passed a milestone statute, *Framework Act on Informatization Promotion* in Aug. 1995. The Act was designed to introduce basic guiding principles on building the KII and creating an information society. It also established the Informatization Planning Office (IPO) in the Ministry of Information and Communication (MIC). See e.g. Ministry of Information and Communication, *This is The Organization Function* ¶ 1 <<http://www.mic.go.kr/blind/eng/d100-0001-1.jsp>> (accessed Aug. 8, 2002) (stating that an Informatization Planning Office (IPO) was established within the Ministry of Information and Communication (MIC)).

37. Tim Kelly, *Broadband Deployment* ¶ National Strategies (3) <<http://www.itu.int/ITU-D/ict/papers/2001/7%20May%20broadband%20press%20updated.pdf>> (accessed Aug. 25, 2002).

38. Korea Now, *Nationwide Optical Cable Network Has Been Completed Ahead of Schedule* ¶ 5 (Feb. 24, 2001) <http://kn.koreaherald.co.kr/SITE/data/html_dir/2001/02/24/200102240012.asp> (accessed Oct. 19, 2002). It was an ambitious plan by any standards: laying a nationwide network of 22,000 km of optical fiber linking 144 cities and similar towns right across the country, ushering in a new era of affordable broadband connectivity. *Id.* What was even more commendable was the fact that the plan was finished two years ahead of the original schedule in December 2000. *Id.* at ¶ 13.

lion, the 22,000 km³⁹ nationwide optical backbone was successfully established by connecting all 144 calling zones with Asynchronous Transfer Mode ("ATM")⁴⁰ services.⁴¹ It is a very impressive achievement considering the fact that the Internet services⁴² were first introduced in 1994, and the first broadband service, which was "cable modem"⁴³ service provided by Thrunet,⁴⁴ started in July 1998.⁴⁵ The completion⁴⁶ of such Internet backbone enables telecom companies to provide wider services to the government and public institutions.⁴⁷

C. IMF TROUGH⁴⁸

When it comes to the ADSL deployment benchmarking, the background information about the South Koreans and their government are good starting points. Since the inception of KII, the government has

39. 22,000km is twenty times longer than the total span of the Korean peninsula, which is 1,100km.

40. *TechEncyclopedia*, *supra* n. 3, at ATM ¶ 2 <<http://www.techweb.com/encyclopedia/defineterm?term=atm>> (accessed Aug. 8, 2002). Asynchronous Transfer Mode (ATM) refers to a network technology for both LANs and WANs that supports real time voice and video and data. *Id.* The topology utilizes switches which creates a logical circuit from end to end and guarantees quality of service (QoS) *Id.* Nonetheless, unlike telephone switches that dedicate circuits end to end, unused bandwidth in ATM's logical circuits can be appropriated when required. *Id.* ATM is extensively used as the backbone technology in carrier networks and large enterprises. *Id.*

41. *National Informatization White Paper*, *supra* n. 34, at 41.

42. The utilization of Internet services in South Korea began in 1994 with the introduction of KORNET by Korea Telecom in June and BoraNet by DACOM in October of the same year.

43. *TechEncyclopedia*, *supra* n. 3, at Cable Modem ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=cablemodem>> (accessed Aug. 8, 2002). A cable modem refers to a modem used to connect a computer to a cable TV service which provides Internet access. *Id.* Cable modems may dramatically increase the bandwidth between the user's computer and the ISP. *Id.* They link to the computer via Ethernet. *Id.* While the service is online all the time, Ethernet is a shared medium, and therefore the speed varies depending on how many customers on that cable segment are using the Web at a given time. *Id.*

44. The official website is available at <<http://www.thrunet.com/>> (accessed Oct. 22, 2002).

45. Paltridge, *supra* n. 2, at 33.

46. Korea Now, *supra* n. 38, at ¶ 9. "The completion of the national fiber optic backbone is the start of building a nation powered by knowledge and information, just as the opening of the Seoul-Pusan Highway was the start of the country's industrial revolution in the 1970s," according to South Korean President Kim Dae-Jung, who spoke at the completion of the backbone project. *Id.*

47. National Research Council, *Broadband: Bringing Home the Bits* 202 n. 46 (National Academy Press, 2001) [hereinafter *Broadband: Bringing Home the Bits*]. In addition, the South Korean government provided free Internet services to all 10,482 K-12 schools. *Id.*

48. AmosWeb: Economic Gloss*arama, *Trough* ¶ 1 <http://www.amosweb.com/cgi-bin/gls_dsp.pl?term=trough> (accessed Aug. 8, 2002). The term "trough" refers to the transition of a business cycle from a contraction and an expansion. *Id.*

taken a very aggressive role in transforming its country into “knowledge-based”⁴⁹ IT developed country. It initiated a comprehensive approach to boost its ailing economy during the IMF financial crisis.⁵⁰

One thing that all South Koreans obtained during the IMF crisis, there has been a clear consensus among political parties about the IT-centric legislations⁵¹ including *Digital Signature Act*,⁵² which set up the basic legal frameworks for e-commerce transactions during the IMF period. In addition, there has been grass-rooted rapport, which played a critical role in strengthening the South Korean government’s cross-sectoral efforts to build an IT-developed country: online stock trading,⁵³ ePost,⁵⁴ commuter telecenters,⁵⁵ tax benefits,⁵⁶ and m-government.⁵⁷

The end of a contraction carries the descriptive term trough. At the trough, the economy has reached the lowest level of production in recent times. The good thing about a trough, however, is that it is a turning point, a turning point to an expansion. So even though a trough is the lowest, it is not necessarily something that’s undesirable.

Id.

49. *National Informatization White Paper*, *supra* n. 34, at 44.

50. The South Koreans have proved the fact that they have been much stronger after any mishaps. Like the remarkable industrialization after the Korean War, the South Koreans once again showed to the world that they can make things better and faster than others without such misfortunes.

51. Ministry of Information & Communications, *Information & Communications White Paper 2001* <<http://www.mic.go.kr/eng/jsp/res/2001chapter2.pdf>> (accessed Oct. 19, 2002).

52. *Digital Signature Act*, Law 6360 (S. Korea).

53. *Singapore Press Holdings Limited*, *The Bus. Times Singapore* (Mar. 4, 2002) <<http://business-times.asia1.com.sg/>> (accessed Aug. 7, 2002). South Korea also has the world’s highest proportion of online stock trading: 69.7 percent of trades on Korean stock exchanges are executed via the Internet. *Id.* One of main reason why South Korea has the highest rate of Internet stock exchange is that online commissions are only 1% of trade value in South Korea. *Id.* For example, Singapore’s online commission rate is four percent. *Id.*

54. ePOST, *About Postal Shopping and ePost* <<http://mall.epost.go.kr:8081/english/Notice/EWEF00H50.jsp>> (accessed Oct. 19, 2002). Unlike the U.S. where USPS is an independent federal agency distinct from the FCC, the postal service is one of the MIC’s activities. *Id.* For example, ePost, an Internet shopping mall was created to promote e-commerce transactions via 3,000 postal offices in S. Korea. *Id.*

55. Ministry of Information & Communications, *MIC Newsletter 69th* (Jan. 2001) <<http://www.mic.go.kr>> (accessed Oct. 22, 2002). The South Korean government established 4,391 community telecenters across the country, where broadband Internet access is provided free of charge. *Id.*

56. The South Korean government provides tax benefits to companies, which make investment on informatization. The government also applies asymmetrical benefits based on the size of the companies. While the benefit amounts to ten percent for small and medium sized companies, the benefit extends only to five percent for the large companies.

57. The South Korean government plans to provide public information and civic services via cellular phones and PDAs.

II. BENCHMARKING ANALYSIS

There are three main causes for the success story of South Korean DSL deployment: supply, demand, and a comprehensive national broadband policy with "dynamic consistency."⁵⁸

A. SUPPLY SIDE

1. *Broadband Market in South Korea*

The explosion of broadband access in South Korea has been beyond everyone's wildest imagination, and it results from a confluence of factors, including the IMF Crisis, Koreans' quick adoption of new technologies,⁵⁹ affordable pricing,⁶⁰ partial market liberalization,⁶¹ and an aggressive government policy to build e-Korea.⁶²

South Korea's greatest assets in the Internet Age are widespread low cost broadband access; increasing penetration of Internet culture via "PC Bang."⁶³ PC Bang is a unique cultural byproduct of the South Korea during the IMF Crisis.⁶⁴ It was one of the main factors, which provided cost-efficient broadband access to many South Koreans.⁶⁵

As for household broadband access, South Korea has a comparative advantage in building DSL infrastructure since ninety-three percent⁶⁶ of residents live within four km radius from Central Office ("CO"),⁶⁷ and

58. A policy is said to have dynamic consistency when government announces a course of action and has the incentives to actually carry out that policy.

59. *National Informatization White Paper*, *supra* n. 34, at 264. For example, as of 2000, 81.6 percent of South Koreans have computers with CPU 586 or higher. *Id.* Only sixteen percent of them have computers below 486. *Id.*

60. While the average monthly fee for the US is \$50, most South Korean ISPs provide ADSL service at the average price of \$25.

61. Pyramid Research, *Behind Korea's Broadband Explosion* ¶ 1 <http://www.pyramidresearch.com/static_content/feature_articles/001201> (accessed Aug. 2, 2002). "Limited privatization allowed an e-sensitive government to prod the domestic industry into investing in broadband." *Id.*

62. *National Informatization White Paper*, *supra* n. 34, at 41.

63. NetValue, *Korea Boasts the Highest E-commerce Site Usage in the World but the Actual Purchase Rate is Low* ¶ 2 <<http://www.netvalue.com/corp/presse/cp0033.htm>> (accessed Aug. 23, 2002). PC Bang literally refers to PC room, the Korean equivalent of an Internet Café. *Id.* In terms of the place of using Internet, 75.3% used at home, while 22.7% in PC Bang, and 18.5% at office, indicating that more people are leaving PC Bang in favor of home and office. *Id.*

64. Chong Pong-im, *Korea Internet White Paper 2001*, 194 (Korean ed., NCA 2001) (translation on file with author) [hereinafter *Korea Internet White Paper*].

65. *Id.* In South Korea, people can go to any PC-Bang, which provides broadband services at the average rate of \$1 per hour. *Id.*

66. *Id.* at 265.

67. *TechEncyclopedia*, *supra* n. 3, at Central Office ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=central+office&x=31&y=7>> (accessed Oct. 22, 2002).

more than forty percent⁶⁸ of them reside in the MDUs including residential apartments.⁶⁹ In addition, seventy percent of the total population resides in the seven largest cities.⁷⁰

In South Korea, there is relatively less price differential between narrowband and broadband services. Unlike the flat rate pricing in the U.S., local telephone calls are charged every minute in South Korea. If a subscriber in South Korea uses the Internet more than eight hours per day, it would be more cost-efficient for him to switch to broadband services.⁷¹ On the other hand, the government has strictly enforced the flat rate policy⁷² for DSL services, ranging from \$19 to \$34 by month, which is considerably lower than the average rate of \$50 in the U.S.

In South Korea, there are seven⁷³ major high-speed Internet Service Providers⁷⁴ ("ISPs"), which control more than ninety percent of the domestic market. Thanks to the government's CNP on broadband market, there has been a good environment to spur open competition among ISPs

Central Office [is] a local telephone company-switching center. There are two types. The first is called an "end office" (EO) or "local exchange" (LE) and connects directly to the outside plant, which is the feeder and distribution system to homes and offices. The end office (often called a "Class 5 office") provides customer services such as call waiting and call forwarding. The second type is the tandem office (also toll office or tandem/toll office), which is a central office that does not connect directly to the customer. Toll call record generation and accounting used to be handled in the tandem offices. Today, the billing is mostly done in the end offices.

Id.

68. Sang Chul Lee, *Broadband Internet: Business Opportunities and Challenges* <http://www.wkforum.org/wkf_eng/wkf_eng_forum/session_details/2001/09/11/custom_311_7641_KT-3e.doc> (accessed Oct. 22, 2002).

69. *National Informatization White Paper*, *supra* n. 34, at 270. As of July 2000, there are more South Koreans that live in MDUs than houses. *Id.*

70. Korea Broadband, *PDC Consulting Short Paper* § Density (Version 3, Oct. 2002) <<http://www.pdsconsulting.net/ShortPaper-KoreaBroadband.pdf>> (accessed Oct. 22, 2002).

71. The subscriber would be better off using DSL services since he ends up paying local telephone charges on top of the dialup Internet access fees.

72. Currently, aggressive pricing from operators is now driving the take-up of broadband services. The average service charge is \$25 per month for 8-Mbps downstream ADSL. Operators are being very aggressive with pricing to gain market share.

73. The list includes Korea Telecom, Hanaro Telecom, DACOM, Thurnet, Dreamline, Onse Telecom, and SK Telecom.

74. *TechEncyclopedia*, *supra* n. 3, at Internet Service Provider ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=internetserviceprovider>> (accessed Oct. 22, 2002). An ISP refers to an organization that provides access to the Internet. *Id.*

Small Internet service providers (ISPs) provide service via modem and ISDN while the larger ones also offer private line hookups (T1, fractional T1, etc.). Customers are generally billed a fixed rate per month, but other charges may apply. For a fee, a Web site can be created and maintained on the ISP's server, allowing the smaller organization to have a presence on the Web with its own domain name.

Id.

with multi-platform technologies, including ADSL,⁷⁵ cable modem,⁷⁶ APT LAN,⁷⁷ and satellite.⁷⁸ (See Table 3)

B. DEMAND SIDE

1. *Killer Application: IP Telephony*

Various factors have been forwarded to help explain the remarkable growth of broadband access in South Korea. The ITU has noted that the popularity of "IP telephony"⁷⁹ may have played a role in the broadband deployment in South Korea.

In January 2000, Serome Technology⁸⁰ introduced its "DialPad" service in South Korea. However, Serome faced a regulatory barrier regarding the classifications of their Dialpad services: Under the *Ministerial Ordinance 111* to the *Telecommunications Business Act*,⁸¹ telecom services are divided into facilities-based services⁸² and value-added services;⁸³ the former includes fixed telephony, including local,⁸⁴ long distance,⁸⁵ international⁸⁶ services, leased line,⁸⁷ and wireless ser-

75. National Computerization Agency, *Korea Internet White Paper 2001*, at 265 (Feb. 28, 2001, NCA 2001) (translation on file with author). In April 1999, Hanaro Telecom started the first commercial ADSL services via the FTTC. *Id.* Hanaro Telecom has two different services based on the maximum download speeds: Pro (8Mbps) and Lite (1Mbps). *Id.* In addition, Korea Telecom also provides ADSL service in the name of Megapss. *Id.*

76. *Id.* at 263. "In July 1998, Thrunet started the first commercial cable modem service in South Korea." *Id.*

77. APT LAN includes Korea Telecom services (B&A, BWLL, Ntopia) and Hanaro Telecom services (A-LAN, CATV Homeland, BWLL Homeland, BWLL Multiline and Hanalan).

78. In May 1996, Samsung SDS started satellite services covering the entire Korean peninsula. As of October 2000, there are three other providers: Korea Telecom, GCT Korea and Mirae Online at the average cost of \$23 per month.

79. See World Telecommunication Policy Forum, *Report of the Secretary-General on IP Telephony* § 2.6 <http://www.enum.org/information/files/ITU_WTPFfinalreport31Jan.pdf> (accessed Oct. 22, 2002) [hereinafter *WPTF 2001*]. "The term "IP Telephony" can mean different things to an engineer and policy-maker and there is no consensus at this point on its exact definition." *Id.* "As a working definition, "IP Telephony" is used as a generic term for the conveyance of voice, fax and related services over packet-switched IP-based networks." *Id.*

80. The official website is available at <<http://www.serome.co.kr/>> (accessed Oct. 22, 2002).

81. *Telecommunications Business Act*, Law 6360 (S. Korea) [hereinafter *Telecommunications Business Act*].

82. *Ministerial Ordinance 111*, Article 3 §§1-5 (S. Korea) [hereinafter *Ministerial Ordinance 111*].

83. *Telecommunications Business Act*, *supra* n. 81, at Article 4 §1(4).

84. *Ministerial Ordinance 111*, *supra* n. 82, at Article 3 §1(a).

85. *Id.* at §1(b).

86. *Id.* at §1(c).

87. *Id.* at §3.

vices⁸⁸ with assigned radio spectrum such as mobile services, whereas the remaining⁸⁹ telecom services correspond to the later.

Within three weeks,⁹⁰ the Korean Communications Commission ("KCC")⁹¹ promptly designated⁹² Dialpad services into two different types: Special Service Provider ("SSP")⁹³ and Value-added Service Provider ("VSP").⁹⁴ In doing so, the South Korean government concluded that IP Telephony would play a critical role in its implementation of e-Korea policy and adopted a supportive attitude to the IP Telephony: while PC-to-PC,⁹⁵ including IP phone-to-IP phone type IPTSPs,⁹⁶ is classified as a VSP, the government classifies other types as SSPs, which do not have a universal service⁹⁷ requirement⁹⁸ as in Facilities-based Service Providers ("FSPs").⁹⁹ In addition, SSPs are only required to register¹⁰⁰ their applications to Ministry of Information and Communications ("MIC")¹⁰¹ rather than to obtain a FSP license.¹⁰² (See Table 4)

88. *Id.* at §4.

89. *Telecommunications Business Act*, *supra* n. 81, at Article 4 §1(4).

90. Nae-Chan Lee, *IP Telephony and the Internet: Republic of Korea Case Study* § Introduction <<http://www.itu.int/osg/spu/wtpf/wtpf2001/casestudies/korea.pdf>> (accessed Oct. 22, 2002). On January 25, 2000, the KCC designated the different types of Dialpad services. *Id.*

91. *Framework Act on Telecommunications*, Law 6360, Article 37 §§1-4 (S. Korea) [hereinafter *Framework Act on Telecommunications*]. Korean Communications Commission (KCC) was established to promote fair competition and protect the rights of users. *Id.* The KCC consists of one chairman and nine commissioners. *Id.*

92. See Nae-Chan Lee, *supra* n. 90, at 13. On January 25, 2000, under the designation of an SSP without switching facilities, excluding routers, servers and system, from the KCC Serome Technology offered for the first time real-time voice services via Dialpad to the public, thus activating IP Telephony services in South Korea. *Id.*

93. *Telecommunications Business Act*, *supra* n. 81, at Article 4 §3.

94. *Telecommunications Business Act*, *supra* n. 81, at Article 4 §4.

95. See Nae-Chan Lee, *supra* n. 90, at 13. Since PC-to-PC can not be provided to the public and hence its effect may be small on the domestic industry and on the public interest, the Korean government decided to classify it as VSP. *Id.*

96. Laura Schneider, *Internet Conferencing: What is IP Telephony* <<http://netconferencing.about.com/library/weekly/aa032100a.htm>> (accessed Oct. 22, 2002).

IP Telephony is also known as Voice over IP or Internet Telephony and it represents the technology which uses IP-based data networks to transmit telephone calls. The challenge that IP telephony faces is to deliver the voice, fax, or video packets in a dependable flow to the user. It does this by taking the voice or data from the source trunk where it is then digitized, compressed because of the limited bandwidth of the Internet, and sent across the network where the process is reversed.

Id.

97. *Telecommunications Business Act*, *supra* n. 81, at Article 2 §1(3).

98. *Telecommunications Business Act*, *supra* n. 81, at Article 3 §§ 1-4.

99. *Telecommunications Business Act*, *supra* n. 81, at Article 4 §2.

100. *Telecommunications Business Act*, *supra* n. 81, at Article 19 §1.

101. The MIC is a primary regulator in South Korea. The official website is available at <<http://www.mic.go.kr>> (accessed Oct. 22, 2002).

From the perspective of “functional equivalence”¹⁰³ of the regulation in offering voice services to the public through IP Telephony, the South Korean government has minimized the control over VoIP¹⁰⁴ in terms of market activity, which is different from its foreign ownership ceiling on FSPs.¹⁰⁵ Since January 1, 2001, foreign ownership limitations on SSPs have been completely removed,¹⁰⁶ thereby opening further the telecom market.¹⁰⁷

Besides its exponential growth¹⁰⁸ of subscriber size, several features of broadband access lend themselves to the use of IP telephony. First, Dialpad’s “presence technology”¹⁰⁹ allows users to signal that they are online to other users. When this feature is combined with the “always on”¹¹⁰ capability of DSL services it can narrow the technical gap of the “architectural differences”¹¹¹ between circuit-switched and IP-based net-

102. *Telecommunications Business Act*, *supra* n. 81, at Article 5 §1.

103. See Nae-Chan Lee, *supra* n. 90, at 13. Functional equivalence is a regulatory concept used in developing a telecom policy that similar or equivalent services should be treated in a similar way. *Id.*

104. *TechEncyclopedia*, *supra* n. 3, at IP Telephony ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=iptelephony>> (accessed Oct. 22, 2002).

The two-way transmission of audio over a packet-switched IP network, when used in a private intranet or WAN, it is generally known as “voice over IP,” or “VoIP.” When the transport is the public Internet or the Internet backbone from a major carrier, it is generally called “IP telephony” or “Internet telephony.” However, the terms IP telephony, Internet telephony and VoIP are used interchangeably.

Id.

105. *Telecommunications Business Act*, *supra* n. 81, at Article 6 §3 (a)-(c).

106. *Telecommunications Business Act*, *supra* n. 81, at Article 19 §§1-4.

107. See Nae-Chan Lee, *supra* n. 90, at 13.

108. *Id.* at 1. In its first month 950,000 users signed up and the number increased by 300,000 per month for the rest of the year. *Id.* The ITU reports that by December 2000 some 4.3 million users had signed up for the service. *Id.*

109. Scott Summerill, *IM and ‘Presence’ Could Drive IP Telephony-Once Standards and Interoperability Are There* ¶ 6 <<http://www.paltalk.com/paltalk2/AboutUs/articles/Growing%20Pains.htm>> (accessed Oct. 22, 2002). Presence technology is a part of AOL’s “Instant Messenger” but uniformity needs to be developed amongst all providers before one user on AOL can receive messages from a user on a different system. *Id.*

110. *TechEncyclopedia*, *supra* n. 3, at Always On ¶ 1 <<http://content.techweb.com/encyclopedia/defineterm?term=always+on&x=32&y=8>> (accessed Oct. 22, 2002). “Always on refers to a system that is online and ready to go 24 hours a day. Nothing has to be turned on or dialed up in order to use it. DSL and cable modems are examples of always-on technologies.” *Id.*

111. *WPTF 2001*, *supra* n. 79, at § 2.9.

IP networks are originally designed for two-way asynchronous communications, typically refers to as “connectionless” or “stateless.” Put another way, there is no unique end-to-end circuit is created and held for the duration of a particular session. On the other hand, telephone networks have been engineered to provide real-time or synchronous, two way voice conversations possible between almost any two points on earth, using circuits created as necessary and held for the duration of the call.

Id.

works. A second advantage of broadband access is the increased “quality of service.” the broadband enabled the higher quality and significantly improved performance.¹¹² Despite its innovative marketing¹¹³ and technical enhancement,¹¹⁴ the recent decline of the global IT industry also hit Dialpad, and it recently filed a federal bankruptcy protection under Chapter 11.¹¹⁵

C. GOVERNMENT SIDE-OPEN ACCESS

1. *Local Loop Unbundling (“LLU”)*¹¹⁶

In benchmarking the South Korean model, the most important factor is the degree¹¹⁷ of market competition in South Korea. Unlike the asymmetrical regulation in the U.S., South Korea is also unique in terms of its balanced enforcement of LLU and Multiple ISP (“M-ISP”).¹¹⁸ In

112. *WPTF 2001*, *supra* n. 79, at § 2.17.

Like the traditional PSTN voice services, quality of service is often the focal point of IP Telephony debate. For example, because there is no total control of traffic management on the Internet, end-to-end quality cannot be guaranteed and typically provides only “best effort” packet delivery. For this reason, the Internet is generally not suitable to carry voice telephony service, which cannot tolerate more than minimal transmission delays.

Id.

113. Paltridge, *supra* n. 2, at 33. One of the major attractions of the Dialpad service was that it, at least, initially offered free PC to PSTN phone calls. *Id.* The IP telephony companies also offer heavily discounted PC to PSTN phone international calls. *Id.* However, Dialpad has changed its market approach by starting relatively low charges both for PC to PC and PC to PSTN. *Id.*

114. *Id.* “In December 2000, Dialpad introduced video IP telephony as part of its service.” *Id.*

115. DefaultRisk.com, *Credit Distress Cases Archive: 4th Quarter, 2001* <http://www.defaultrisk.com/news_2001_q4.htm> (accessed Oct. 22, 2002). Sang-soo Oh, a former Serome CEO, recently received permission from a federal bankruptcy court to take over Dialpad Communications by establishing a new company called DAC. *Id.*

116. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 148-52. DSL unbundling can occur at the physical level, which permits variation in the DSL service that the competitor provides, and at the resale level. *Id.* Where incumbents extend fiber closer to customers, replacing a portion of the existing copper plant, copper pairs no longer run all the way from premises to the central office, making physical unbundling very complex. *Id.* This former of unbundling type is made available in raw form to the competitor has the additional advantage to the competitor of helping to isolate the quality and nature of the competitor’s service from potential adverse actions of the incumbent. *Id.* With simple resale, the competitor is confined to deriving revenue from the differential between the resale and retail rates, whereas unbundling gives the competitor latitude to provide differentiated services that combine unbundled elements with elements provided by the competitor. *Id.*

117. Paltridge, *supra* n. 2, at 4. According to the OECD, the mere existence of a rival infrastructure is not enough to establish de facto broadband market competition. *Id.* Often the same company owns the broadband choices in some OECD countries. *Id.* The question remains regarding the degree of competition rather than its mere existence. *Id.*

118. Multiple ISP enables telecom companies to provide telecom services without their own networks.

doing so, the government has successfully fostered the market competition on a multi-platform basis.¹¹⁹

In its continuous efforts to promote user benefits through increased competition, the South Korean government revised¹²⁰ the *Telecommunications Business Act*¹²¹ in January 2001. The main revisions included the increased foreign ownership ceiling for Korea Telecom,¹²² caller ID service,¹²³ number portability,¹²⁴ and LLU.¹²⁵

Pursuant to the Article 33, Facility-based Service Providers ("FSPs")¹²⁶ in South Korea are required to share the local loop if other telecom service operators request.¹²⁷ The issue of LLU is very important to most broadband-developing countries, since in many cases, local incumbent telecom companies have been very reluctant to share their fiber-optic lines with any other possible competitors.

2. Broadband Building Emblem System¹²⁸

In April 1999, the South Korean government introduced¹²⁹ a unique¹³⁰ DSL promotion policy.¹³¹ Broadband Building Certification Emblem System,¹³² which is the functional equivalent of Fiber-To-The-Building ("FTTB").¹³³ Based on the building broadband capacity, the

119. *Korea Internet White Paper*, *supra* n. 64, at 85.

120. The revised Act is in effect as of April 9, 2001 (S. Korea).

121. *Telecommunications Business Act*, *supra* n. 81.

122. *Id.* at Article 6 §§ 1-3

123. *Telecommunications Business Act*, *supra* n. 81, at Article 54 § 2. Caller ID block service is also available under *Enforcement Act 17237*, Article 25 §4; *see also National Informatization White Paper*, *supra* n. 34, at 44.

124. *Telecommunications Business Act*, *supra* n. 81, at Article 38 §4.

125. *Telecommunications Business Act*, *supra* n. 81, at Article 33 §6 (1).

126. *Telecommunications Business Act*, *supra* n. 81, at Article 4 §2.

127. *Telecommunications Business Act*, *supra* n. 81, at Article 33 §6 (1).

128. Literally, the system is called a "Super High-speed Information Communications Building Certification Emblem System." In this paper, we will use the convenient form as "Broadband Building Emblem System."

129. Pursuant to Article 32 §2 of the *Residential Building Standard Act*, effective in May 2001, all MDUs are required to provide broadband access to their residents in South Korea.

130. Interestingly, the U.S. also introduced "Smart Building Policy Project" in 1999, but it did not have any practical effect on the DSL deployment in the U.S. because it was hotly debated on "equal access" issues rather than actual deployment of the DSL.

131. *National Informatization White Paper*, *supra* n. 34, at 270.

132. The official website is available at <<http://infonet.mic.go.kr/~cert/>> (accessed Oct. 22, 2002).

133. Whatis.com., *Fiber to the Curb* <http://searchnetworking.techtarget.com/sDefinition/0,,sid7_gci213962,00.html> (accessed Oct. 19, 2002). "Fiber to the building (FTTB) refers to installing optical fiber from the telephone company central office to a specific building such as a business or apartment house." *Id.*

MIC will issue¹³⁴ one of four official emblems,¹³⁵ which can be displayed on the building for its advertisement purposes.¹³⁶ In doing so, the government revised the *Enforcement Act 16797*¹³⁷ to the *Framework Act on Telecommunications*,¹³⁸ which requires the applicants to file with local postal offices.¹³⁹

What is more interesting is the fact that the MIC will issue preliminary¹⁴⁰ emblems even before the completion of buildings, so that the building contractors can take full advantage of the certification system by using the emblems for their official advertisements or model houses. Most certified buildings have two types, residential and business, and two services, basic¹⁴¹ and value-added.¹⁴²

The emblem system turned out to be a success since the extra construction cost is increased by 0.7 percent only even in adding the first class broadband capacity, but its advertisement was very effective:¹⁴³ it increased the apartment price by \$3,300 to \$7,700 per unit.¹⁴⁴ As of December 2001, there are 1,369 building certifications issued, but they have been heavily concentrated in residential buildings across the Seoul Metropolitan area.¹⁴⁵

Unlike the equal access¹⁴⁶ dilemmas in the United States Smart

134. Every quarter, MIC will personally deliver the official emblems to selective applicants.

135. Like hotel ratings, it includes first class, second class, third class and quasi-third class.

136. *National Informatization White Paper*, *supra* n. 34, at 270.

137. *Enforcement Act*, Law 16797, Article 14 §1 (S. Korea).

138. *Framework Act on Telecommunications*, *supra* n. 91.

139. *Ministerial Order 93*, Article 4 (S. Korea).

140. *Enforcement Act*, Law 16797, Article 14 §1 (S. Korea).

141. All households are assigned e-mail addresses and Internet homepage space as a basic service.

142. Value-added services such as security services and home automation are also available.

143. Ministry of Information and Communication, *Numerous Applications for High Speed Building Certification* <<http://www.mic.go.kr>> (May 21, 1999).

144. *Id.*

145. Ministry of Information and Communication, *Broadband Building Emblem System Application Status*, (Dec. 2001) <<http://www.infonet.mic.go.kr/ezboard/db/cert2/upload/200202080000/cert200112.htm>> (accessed Aug 27, 2002). 764 out of 1,369 emblems have been issued for residential buildings in the Seoul Metropolitan Area. *Id.*

146. National Telecommunication and Information Administration, *Promotion of Competitive Networks in Local Telecommunications Markets* ¶ 1 <<http://www.ntia.doc.gov/ntia/home/broadband/comments3/SmartBuildingProjectAttachments.pdf>> (accessed Aug. 25, 2002). The SBPP argues that the “*Telecommunications Act of 1996* contemplates three forms of competitive entry: resale, unbundled network elements, and facilities-based entry.” *Id.*

The building owners' and managers' unfettered control over access is impeding one of the goals of the Act — widespread facilities-based entry. Moreover, when unreasonably exerted, this unfettered control not only impedes the development of

Buildings Policy Project ("SBPP"),¹⁴⁷ there is the clear sign of cooperation between building contractors and four ADSL service providers, including Korea Telecom,¹⁴⁸ Hanaro,¹⁴⁹ Thrunet,¹⁵⁰ and Dreamline.¹⁵¹ Put another way, there has been a trend of vertical integration in DSL industry. For example, Samsung, better known as a South Korean electronic manufacturer, has taken full advantage of the emblem system. In its "Cyber APT" promotion, it uses a catch phrase, "e-convenient APT," which has effectively defeated its rival company, Hyundai. (See Table 5)

3. *e-Korea*¹⁵²

In order to rejuvenate its domestic economy, the South Korean government has cleared up many legal and regulatory obstacles to information-oriented society, thereby paving the way for spreading the broadband access.¹⁵³ For example, the government revised the *Act on Promotion of Utilization of Information and Communications Network* to broaden the scope of regulation from telecom services¹⁵⁴ to information and communications service¹⁵⁵ by redefining "information and communications service providers."¹⁵⁶

In order to protect the stability of information communications network,¹⁵⁷ the MIC revised the *Ministerial Order 117* to the *Act on Promo-*

facilities-based telecommunications competition, but also frustrates the ability of carriers to deploy next generation fiber-based and other facilities necessary to provide high-speed Internet access and other advanced services.

Id.; see also *Broadband: Bringing Home the Bits*, *supra* n. 47, at 193.

147. National Telecommunication and Information Administration, *Smart Buildings Policy Project's Response to NTIA Request for Comment on Development of Broadband Networks and Advanced Telecommunications Services* <<http://www.ntia.doc.gov/ntiahome/broadband/comments3/SBPP.htm>> (accessed Aug. 25, 2002). The Smart Buildings Policy Project (SBPP) is a group of telecom carriers, equipment manufacturers, and organizations that support nondiscriminatory telecom carrier access to tenants in multi-tenant environments. *Id.* The SBPP urges the FCC to adopt rules that allow telecom carriers to obtain reasonable and nondiscriminatory access to tenants in multi-tenant environments ("MTEs" or "buildings"). *Id.*

148. The official website is available at <<http://www.kt.co.kr>> (accessed Oct. 22, 2002).

149. The official website is available at <<http://www.hanaro.com/>> (accessed Oct. 22, 2002).

150. The official website is available at <<http://www.thrunet.com/>> (accessed Oct. 22, 2002).

151. The official website is available at <<http://www.dreamline.co.kr/>> (accessed Oct. 22, 2002).

152. *National Informatization White Paper*, *supra* n. 34, at 41.

153. *Id.*

154. *Framework Act on Telecommunications*, *supra* n. 91, at Article 2 §7.

155. *Act on Promotion of Utilization of Information and Communications Network*, Law 6360 Article 2 §1(2) (S. Korea) [hereinafter *Act on Promotion of Utilization*].

156. *Id.* at Article 2 §1(3).

157. *Id.* at Article 2 §45(1).

*tion of Utilization of Information and Communications Network*¹⁵⁸ regarding commercial information transfer.¹⁵⁹ Effective on August 28, 2001, every commercial spammer is required to identify¹⁶⁰ its content¹⁶¹ as spam e-mail in the subject line¹⁶² and to provide sender's name and contact information,¹⁶³ either telephone numbers or e-mail addresses in the body of each e-mail.

In addition, the spammers are required to provide the recipients an opportunity to opt-out from their group e-mail lists.¹⁶⁴ (See Table 6) Furthermore, the South Korean government has planned to extend its anti-spamming laws to cellular phone, fax, and telephone¹⁶⁵ advertisement as well.¹⁶⁶

In reviewing aforementioned factors, it seems likely that the pressure and incentives to shift towards a DSL paradigm will vary between South Korea and the United States on the basis of the different status of development and the differing degrees of market competition. What makes the South Korean model different is the government's intervention but authoritative enforcement of broadband policy.

III. RECOMMENDATIONS FOR THE UNITED STATES

A. LAISSEZ FAIRE

It is clear that South Korea has been the leading country in recent broadband race, and it is likely that it will keep such momentum for the time being. However, the magic formula would not be necessarily applicable to the United States. Basically, the American government can adopt a comprehensive "open access" policy: both LLU and M-ISP.¹⁶⁷ Put another way, the government should promote more facilities-based competition by enforcing M-ISP policy to require cable companies to unbundled their fiber optic cables to competitors. Like the unbundling

158. See generally *id.*

159. *Id.* at Article 50 §§ 1-2.

160. *Ministerial Order 117*, Article 11 §1 (S. Korea).

161. Generally, there are three types of spamming: advertisement, information, and adult advertisement.

162. *Ministerial Order 117*, Article 11 §2.

163. *Id.* at §1.

164. *Act on Promotion of Utilization*, *supra* n. 155, at Article 50 §1.

165. As for telephone and cellular phone advertisements, the senders are required to identify their messages as advertisements before starting any communications.

166. Ministry of Information & Communications, *Comprehensive Anti-Spamming Law on the Corner* <http://www.mic.go.kr/jsp/mic_p/p100-0002-1.jsp?m_code=d100-23481&search=+%&string=%09&curpage=1> (accessed Aug. 12, 2002). The South Korean government has worked on the *Act on Promotion of Utilization of Information and Communications Network* to extend anti-spamming laws to cellular phone and fax. *Id.*

167. While LLU is generally required in the U.S. telephony industry, the FCC recently concluded that it would not yet enforce M-ISP.

cases in the OECD study,¹⁶⁸ M-ISP policy should be enforced in the best interest of the American public in general. (See Table 7)

In doing so, M-ISP would increase the total subscriber number, and the entire broadband industry can benefit via the increased economies of scale: the more subscribers they can get, the more revenues they can make out of their broadband services in the aggregate. Merely guarding their fiber optic cables would not generate such virtuous circle of broadband deployment. Developing a technology neutral competition would be a positive step toward fostering a pro-competitive market environment conducive to the wider use of broadband infrastructure and applications. (See Table 7)

B. NEWTON'S LAW OF INERTIA

As a threshold matter, it is useful to set forth comprehensive e-government policy objectives for broadband deployment that could form the basis for any regulatory approach. These objectives could form the parameters for a benchmarking analysis of the South Korean DSL policies.

DSL deployment may also be considered as part of a broader process of developing an e-centric government policy, and it should be recognized that current DSL technologies are not built for transmitting e-mail traffic alone, but as part of a broader strategy for offering multimedia services. In that sense, the South Korean government was successful in developing best practices for creating favorable market conditions for investment and deployment of DSL infrastructure.

In analyzing the South Korean model, the U.S. policymakers should recognize the different level of the market maturity¹⁶⁹ and the complexity of policymaking process in the U.S. broadband sector.¹⁷⁰ Unlike the conventional narrowband case,¹⁷¹ the policymakers should introduce and vigorously enforce nationwide broadband policy to foster the deployment since the broadband marketplace is still in its infancy stage, and it has been evolving in uncertain directions.

In addition, the U.S. policymakers must face the reality that there has been cultural conservatism in the U.S. telecommunications industry, which tends to contribute to a relatively slow pace of regulatory development. When such cultural entropy is combined with the current regula-

168. See generally Paltridge, *supra* n. 2.

169. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 171. As for the narrowband regulation, the principal issues in fashioning narrowband industry is to facilitate the efficient conversion of a mature marketplace dominated by a single monopolistic provider to a competitive marketplace serviced by different facilities-based and non-facilities-based providers. *Id.*

170. *Id.* at 170.

171. *Id.* at 171.

tory moratorium,¹⁷² the U.S. economy as a whole could face a long-term consequence of losing international competitiveness in the face of rapid change of the global IT industry.

C. FOUR CONSIDERATIONS TO THE U.S. BROADBAND DEPLOYMENT

1. *Technical Considerations*

In the United States, there is a widespread misconception about broadband technologies: the future of broadband is a shootout among competing technologies that will result in a single technology dominating nationwide. This view, however, is rather simplistic and unrealistic; at least currently there is no single superior technology option. Broadband is going to be characterized by diverse technologies for the foreseeable future. Accordingly, the American DSL policy "should reflect the existence of a diverse set of solutions that depend on particular circumstances rather than a technology monoculture."¹⁷³ In current situation, there are two main access technologies: wireline and wireless.¹⁷⁴ For wireline access, the possible technologies include hybrid fiber coax ("HFC"),¹⁷⁵ DSL, fiber optics in the loop,¹⁷⁶ and powerline.¹⁷⁷

172. As of April 2002, there is no comprehensive national policy on broadband issues in the U.S. .

173. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 122.

174. This comment only discusses the wireline options.

175. Whatis.com, *Hybrid Fiber Coaxial Network* <http://searchnetworking.techtarget.com/sDefinition/0,290660,sid7_gci213494,00html> (accessed Aug. 2, 2002).

A hybrid fiber coaxial (HFC) network is a telecommunication technology in which optical fiber cable and coaxial cable are used in different portions of a network to carry broadband content. Using HFC, a local CATV company installs fiber optic cable from the cable head-end (distribution center) to serving nodes located close to business and residential users and from these nodes uses coaxial cable to individual businesses and homes. An advantage of HFC is that some of the characteristics of fiber optic cable (high bandwidth and low noise and interference susceptibility) can be brought close to the user without having to replace the existing coaxial cable that is installed all the way to the home and business. Both cable TV and telephone companies are using HFC in new and upgraded networks and, in some cases, sharing the same infrastructure to carry both video and voice conversations in the same system.

Id.

176. See generally *Broadband: Bringing Home the Bits*, *supra* n. 47, at 129-34. Fiber is preferred wherever individual demand is very high or demand from multiple users can be aggregated. *Id.* at 130. Both HFC system and DSL system can benefit from pushing fiber further into the system, including FTTC and FTTH. *Id.*

177. *Id.* "There has been less of a push to use powerline connectivity in the United States., in part because the U.S. power distribution system, in which each secondary transformer serves only a few households (on the order of 5), makes the per-subscriber capital costs much higher." *Id.* at 135. In addition, there has been an overarching concern regarding interference with other wireless applications. *Id.* at 136.

Due to the distance constraints¹⁷⁸ of the DSL technologies, there are a few options to cover the underserved areas. For example, cable modem service might be a viable technical alternative to cover broader geographical areas since it has the penetration rate of ninety-seven percent in the U.S.¹⁷⁹ However, the penetration rate does not represent the two-way communicable HFCs, which amount to roughly seventy percent of them.¹⁸⁰ Using the duotone approach would be a more practical choice in furthering the U.S. broadband deployment in the aggregate.

However, as for the remote rural areas, the United States government must provide something other than the South Korean model, since it would cost too much to build the fiber-optic backbone in less populated areas, such as Montana. Wireless technologies, including satellite broadband service,¹⁸¹ are a commercially viable alternative.

2. Regulatory Considerations

Like most countries, facilities-based competition is not currently widespread in the U.S., therefore actual network rollout has been slower, and the prices have remained high.¹⁸² Unfortunately, there is no comprehensive and consistent national broadband policy¹⁸³ in the U.S. Such lack of clear regulatory guidelines can complicate matters where there are new political alliances formed among multiple players in DSL policy arena:¹⁸⁴ political economy.¹⁸⁵ Such complexity of the U.S. broadband policymaking process has become part of regulatory barriers to its rapid deployment.

Due to the recent convergence of technologies and markets, the U.S. regulators have difficulties in keeping up with the definitions they de-

178. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 128. As for ADSL services, its maximum distance of deployment is 5.5 km radius from central offices. *Id.* However, the distance remarkably decreases to 1.5 km radius for HDSL services. *Id.*

179. *Id.* at 123.

180. *Id.*

181. *Id.* at 144. "Satellite services have been available for many years, based on geosynchronous Earth orbit (GEO) satellites. Satellite access clearly has significant advantages in terms of rapid deployment and national coverage. . . but has cost and performance limitations and system capacity limitations, particularly for uplink traffic." *Id.*

182. See generally Thomas W. Hazlett, *Regulation and Vertical Integration in Broadband Access Supply* <<http://www.manhattaninstitute.org/hazlett/Regulation%20and%20Vertical%20Integration%20in%20Broadband%20Access%20Supply.pdf>> (accessed Aug. 27, 2002). The cross-ownership between cable TV operators and incumbent telephone companies, rollout is also even slower. *Id.*

183. Federal Communications Commission, FCC 02-77 (Mar. 14, 2002) <http://www.fcc.gov/Bureaus/Cable/News_Releases/2002/nrcb0201.html> (accessed Aug. 25, 2002).

184. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 168.

185. *Id.* "Viewed through the lens of telecommunications policy, broadband involves a system with player and rules at federal, state and local levels and a long history of political activity." *Id.*

velop and use. For example, the *Telecommunications Act of 1996* has statutory languages including “advanced services.” Subsequently, the FCC defined it to be at least 200 kbps in either direction.¹⁸⁶ However, such “static definition”¹⁸⁷ has often turned out to be problematical on the long-term basis due to the rapid technological development.

Upon the recent reorganization, it is time for the FCC to take a leadership role in streamlining the national broadband policy in the U.S. The recent Notices of Proposed Rule Making (“NPRMs”), including wireline broadband¹⁸⁸ and cable modem service,¹⁸⁹ seem promising in the right direction. Perhaps, a simplified regulatory structure is an important element in establishing favorable market conditions for further investment in DSL deployment. In doing so, the general public will get the benefits of the broadband access in the face of the continuous cycle of legislative delay.¹⁹⁰

186. Federal Communications Commission, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Docket No. 98-146 <<http://ftp.fcc.gov/Speeches/Copps/Statements/2002/stmj204.html>> or <http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrcc9004.html> (assessed Oct. 22, 2002).

187. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 174.

188. Federal Communications Commission, *FCC Launches Proceedings to Promote Widespread Development of High-Speed Broadband Internet Access Services* ¶ 2 (Feb. 14, 2002) <http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/2002/nrcc0202.html> (accessed Aug. 25, 2002). The FCC tentatively concluded in a NPRM adopted on Feb. 14, 2002 that:

the wireline broadband Internet access services - whether provided over a third party's facilities or self-provisioned facilities - are information services, with a telecommunications component, rather than telecommunications services. Information services include such services as voice mail and e-mail, which ride over telecommunications facilities.

Id.

189. Federal Communications Commission, *FCC Classifies Cable Modem Service as “Information Service”* ¶ 2 (Mar. 14, 2002) <http://www.fcc.gov/Bureaus/Cable/News_Releases/2002/nrcb0201.html> (accessed Aug. 25, 2002). In a Declaratory Ruling:

the FCC concluded that cable modem service is properly classified as an interstate information service and is therefore subject to FCC jurisdiction. The FCC determined that cable modem service is not a “cable service” as defined by the Communications Act. The FCC also said that cable modem service does not contain a separate “telecommunications service” offering and therefore is not subject to common carrier regulation.

Id.

190. After serious Congressional debate, the House of Representatives recently passed the *Internet Freedom and Broadband Deployment Act*, H.R. 1542, 107th Cong., 2001. However, there is a question whether this bill can pass the Senate.

3. *Legal Considerations*

The U.S. DSL industry might face additional legal impediments in their content development. For example, online privacy is a hotly contested area of law in the U.S., but it is rather simple¹⁹¹ in South Korea. While the U.S. legislature vigorously produced several laws to protect the online privacy of its citizens, the entire e-industry, including DSL sector, has to bear the burden as costs of doing e-business.

For example, most of the U.S. privacy laws require rather ambiguous conditions which make U.S. e-industry to suffer from legal paranoia of getting sued by a third party. As for children's online privacy, there are three major federal statutes on point: *Children's Online Privacy Protection Act* ("COPPA"),¹⁹² *Child Online Protection Act* ("COPA"),¹⁹³ and *Child Pornography Protection Act* ("CPPA").¹⁹⁴ In addition, each statute has various legal terminology which can easily confuse many laypersons.¹⁹⁵

While there are these federal laws regarding children's online privacy in the U.S., there is only one comprehensive statute regarding the subject matter in South Korea.¹⁹⁶ Such simplified and centralized legal framework was one of the major driving forces in furthering the unprecedented DSL deployment in South Korea. (See Appendix B)

4. *Economic Considerations*

Due to its initial high costs for network rollout, the consumers must pay high prices for current DSL services.¹⁹⁷ The U.S. consumers must make a trade-off between price and quality. Willingness to make such trade-off will generally depend on price sensibility, the perception of the quality of service, and the interest of consumers in using the more advanced DSL services including voice-over-DSL ("VoDSL").¹⁹⁸

191. In Korean, there is no equivalent word for "privacy" in English. The South Korean government uses the English word, "privacy" whenever it has to refer to it.

192. 15 U.S.C. §§ 6501 et seq. (2000).

193. 47 U.S.C. § 231 (2000).

194. 18 U.S.C. § 2251 (2000).

195. See generally 15 U.S.C. § 6501(9)(2000). For example, the COPPA requires operators to obtain prior "verifiable parental consent" before collection personal information regarding a particular child. However, the question lies with the statutory interpretation of "verifiable consent." The same logic applies to the "reasonable effort" requirement as well.

196. See generally *Act on Promotion of Utilization*, supra n. 155.

197. Average monthly charge for DSL services in the United States is around \$50.

198. *TechEncyclopedia*, supra n. 3, at VoDSL ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=VODSL&exact=1>> (accessed Aug. 23, 2002). Voice over DSL (VoDSL) refers to sending voice over a DSL line. *Id.*

Using compression, a large number of voice channels can be placed on DSL channels, which makes the technology very attractive. For example, up to 150 voice channels can be transmitted over a 1.5 Mbps DSL line. DSL signals at the cus-

Accordingly, many people considered such slowness of broadband deployment in the U.S. as lack of “killer applications.”¹⁹⁹ The questions continue what are the killer applications for the US broadband industry. Perhaps, the South Korean model gives U.S. e-industry insights what to expect. In South Korea, there have been a variety of candidates for killer applications, including Kimchi recipes, cellular phone ring downloads, IP Telephony, and online gaming. However, most of them turned out to be mere “filler applications”²⁰⁰ without economically viable e-business model but online gaming.

Recently, the South Korean online game industry adopted a different business strategy: “Pay-to-Play”²⁰¹ approach. Unlike the U.S., the South Korean companies, including NCsoft,²⁰² distribute free²⁰³ copies of multimedia game software that users can download free either at home or at widespread PC-Bangs.²⁰⁴ While the U.S. companies normally charge \$30-\$70 for the software purchase to cover their initial costs and \$10-\$20 monthly subscription fees to cover operational costs, NCsoft charges the end-users only \$20-\$30 monthly subscription fees. (See Table 8)

Such a pro-consumer e-business model turned out to be a surprising success. Its success is based on the increased size of the online game players: the more players, the more revenues it can generate from the monthly subscription. By using “Pay-to-Play” approach, South Korean firms can widen their potential customer base and reduce transaction costs, while national economies can benefit from the spillover effect via new e-commerce opportunities.²⁰⁵ However, it might not be per se applicable to the current U.S e-industry because of the U.S.’s strong policy to

tomerside are delivered into an integrated access device (IAD), which forwards them over twisted pair to the carrier. The signals go to the carrier’s DSLAM and then to an access switch that forwards voice to a voice gateway and then the PSTN and data to the appropriate data network.

Id.

199. *TechEncyclopedia*, *supra* n. 3, at Killer App ¶ 1 <<http://www.techweb.com/encyclopedia/defineterm?term=killer+app>> (accessed Aug. 23, 2002). A killer application refers to an application that is exceptionally useful or exciting. *Id.* When new operating systems are on the horizon, people wish for one or two killer apps that run under the new system in order to justify the migration effort and expense. *Id.*

200. A filler application refers to a well-written application that performs reasonably well. Many filler apps are bundled with PCs and other software combos.

201. Pyramid Research, *Online Gaming and Broadband: Partners in Profit, How Korean Operators Turn Virtual Games into Real Revenue* <http://www.pyramidresearch.com/info/rpts/dec01_agame.asp> (accessed Aug. 25, 2002).

202. The official website can be found at <<http://www.ncsoft.co.kr>> (accessed Oct. 22, 2002).

203. *Korea Internet White Paper*, *supra* n. 64, at 192.

204. *See generally* NetValue, *supra* n. 63.

205. *Broadband: Bringing Home the Bits*, *supra* n. 47, at 188.

protect intellectual property rights in the Internet. It is suggested that it would help U.S. broadband deployment if the American government could adopt a more comprehensive e-friendly policy by liberalizing legal frameworks, including copyright,²⁰⁶ trademarks,²⁰⁷ and patent.²⁰⁸

IV. CONCLUSION

In sum, South Korea seems to be well set to solidify its position as a leading market in broadband. In terms of providing the benefits of widespread affordable broadband access to its urban and rural residents, South Korea is unparalleled in the OECD arena. Despite the aforementioned differences, both South Korea and the U.S. will benefit from the ripple effect of their advanced broadband capabilities: during the upcoming 2002 World Cup football series in Korea and Japan, the soccer fans in both countries can watch the games on real-time basis via the Internet broadcastings irrespective of their physical locations.

206. *Digital Millennium Copyright Act*, 17 U.S.C § 512 (2000).

207. *Anticybersquatting Consumers Protection Act*, 15 U.S.C. § 1125(d) (2000).

208. *Korea Internet White Paper*, *supra* n. 64, at 136. Unlike the U.S. patent laws, there is no patent protection for business method related invention in South Korea. *Id.*

APPENDIX A

Telecom Legislative History in South Korea 1976-2000

	Names	Revisions	Descriptions
1976	<i>Information & Communications Work Business Act</i>	2/5/1999	Management of construction work permitting of information and communications construction business and contract of construction work.
1983	<i>Framework Act on Telecommunications</i>	1/28/2000	Basic guiding principles on telecommunications, ministerial authority regarding promotion of telecommunication technology, articles on standards, management of telecommunications networks, organization and operation of Korea Communications Commission.
1983	<i>The Telecommunications Business Act</i>	1/28/2000	Articles on licensing criteria, selection, and registration of telecommunication operators, competition safeguards among telecommunications operations, rights of telecommunications service users, and articles on construction/maintenance of telecommunications facilities.
1986	<i>Act on Expansion of Dissemination & Promotion of Utilization of Information System</i>	12/15/2000	Basic guidelines on utilization of the information and communications networks and their operation. Basic plan for the information and communications networks utilization.
1986	<i>The Computer Program Protection Act</i>	1/21/2000	Intellectual property rights, registration of program, Operation of program, Evaluation and Coordination Committee Stipulating the scope, content, limitations and effective period of IPR protection.
1987	<i>Software Development Promotion Act</i>	1/21/2000	Basic guidelines on software program development and promotion, information management, legal framework and funding, operation of the Software Promotion Committee.
1993	<i>Protection of Communications Secrets Act</i>		Basic guiding rule to protect the secrets of communications and further freedom of communications.
1995	<i>Framework Act on Informatization Promotion</i>	1/21/1999	Basic guiding principles on building the Korea Information Infrastructure and creating an information society, basic and action plan for informatization promotion, organization/operation of Information Promotion Committee, operation of the Informatization promotion Fund.
2000	<i>Digital Signature Act</i>		Basic guiding principles on digital signature, Stability and reliability of digital documents, promoting the usage of digital document.
2000	<i>Act on Management of Knowledge Information Resources</i>		Basic guiding principles on management and use of knowledge information resources.

Source: The ITU

APPENDIX B

Online Child Privacy Law Comparison

US	Key Provisions	Korea	Key Provisions
<p><i>Children Online Privacy Protection Act of 1998</i> (COPPA)</p> <p>15 USC §§ 6501-6</p>	<p>-Operator must obtain prior verifiable parental consent prior to its inform collection.</p> <p>-Operator must provide notice on its website regarding its collection, use & disclosure of children's info if its website is directed at children or it has actual knowledge of personal inform collection from children</p> <p>-Before collection, Operator must take any technically reasonable effort to ensure parent's notification & authorization of collection, use, & disclosure of PI</p>	<p><i>Act on Promotion of Utilization of Information Communications Network</i></p> <p>Law 6360</p>	<p>Article 31</p> <p>-Telecom companies must receive consent from parent to collect information from minor under 14</p>
<p><i>Child Online Protection Act of 1998</i> (COPA)</p> <p>47 USC §231</p> <p>-Enforcement of COPA has been temporarily enjoined pursuant to <i>ACLU v. Reno</i> (31 F. Supp 2d 473)</p>	<p>-WWW communication w/ materials harmful & available to any minor</p> <p>- Person shall not disclose any info collected for age restriction w/o prior written or electronic consent of adult Individual or his parents if his age <17.</p>		<p>Article 42</p> <p>-ISP must post warning under 19 either audio, text, or visual display</p> <p>E: Article 21§1</p>
<p><i>Child Pornography Protection Act of 1996</i></p> <p>18 USC §2251</p>	<p>-Any person shall not make, assist, or transport any minor to engage in any sexually explicit conduct to provide any visual depiction if he knows or has reason to know that such visual depiction will be transported or mailed in interstate or foreign commerce.</p>		<p>Article 65 §1(2)</p> <p>-Complete prohibition on pornography in the Internet</p>

Source: Ministry of Information and Communications

APPENDIX C

Table 1. OECD DSL Deployment Status (June 2001)

	DSL Subscribers	Increase from 2000	Broadband Penetration	DSL Coverage*	Rank June 2001	Rank End 2000
Korea	4,205,813	53 %	13.91%	92%	1	1
Canada	702,267	51%	6.22%	69%	2	2
Sweden	122,000	190%	4.52%	N/A	3	4
USA	3,334,491	37%	3.24%	50%	4	3
Netherlands	97,000	547%	2.74%	40%	5	6
OECD	10,643,752	68%	1.96%	N/A	N/A	N/A
EU	1,913,157	200%	0.82%	N/A	N/A	N/A

Source: The OECD
DSL coverage is based on 2000 data.

Table 2. Internet Activity Comparison Between Korea and US

	Household broadband access	Average monthly surfing time	Audio & Video Usage	Multimedia Game Usage	E-commerce Site Usage	Secure Transaction Rate
Korea	57.3%	19.0 hours	73.9%	54.1%	78.2%	28.3%
US	11.1%	11.9 hours	29.5%	5.8%	73.9%	28.8%

Source: NetValue

Table 3. High Speed ISPs in South Korea

	Korea Telecom	Hanaro Telecom	DACOM	Thrunet	Dreamline	Onse Telecom	SK Telecom	Etc
ADSL	Y	Y		Y	Y			56.2%
CATV		Y	Y	Y	Y	Y	Y	32.4%
APT.LAN	Y	Y	Y			Y		11.2%
Satellite	Y							0.2%
Market Shares	49.4%	26.4%	1.6%	16.7%	2.3%	3.0%	0.6%	100%

Source: Ministry of Information Communication

Table 4. Classifications of Service Providers

Category	Facility-based Service Provider (FSP)	Special Service Provider (SSP)	Value-added Service Provider (VSP)
Facilities	Own facilities	Leased facilities	Leased facilities
Sub-services	Fixed telephony, telegraph, telegram, private leased circuits, mobile services, and other services specified by the MIC	Voice resale, IP Telephony, int'l call-back, aggregator, rebiller, in-building communication service	All value-added telecom services
Market Entry	Licensing	Registration	Notification
Universal Service	Cost-burden	None	None
Dialpad Case	N/A	Phone-to-Phone PC-to-Phone	PC-to-PC IP IP-to-IP phone

Source: Ministry of Information and Communication

Table 5. Interrelations between FSPs and Construction Companies

APT Names	Construction Companies	FSPs
Cyber Apartment	Samsung Construction	Hanaro
Hanshin Imagine APT Hanshin IT Tower	Hanshin Construction	Hanaro
Woobang APT	Woobang Construction	Korea Telecom
Internet APT	Hyundai Construction	N/A

Source: Ministry of Information & Communication

Table 6. Korean Anti-spamming Policy

Requirements	Formats
Subject Line Senders must include one of three types of advertisement in each email subject.	[Advertisement] [Information] [Adult advertisement]
Body Senders must include their names and contact information either telephone numbers or email addresses.	Ministerial Order 117, Article 11 §1(1)
Senders can include the consent of the recipients only the latter make prior consent.	[Consent]
Senders must provide the recipients opportunity to opt out.	Ministerial Order 117, Article 11 §1(2) Article 50 §2(3) Article 50 §1

Source: MIC

Table 7. LLU Considerations

Advantage	Disadvantage	OECD Comment	South Korean Model
Encourage competition by reducing economic barriers to new entrants	Reduce incumbent's incentives to construct competitive facilities	LLU is available at cost-based prices. LLU eventually promote further deployment by a wider customer base	LLU further fierce market competition because LLU helps new entrants to compete w/ incumbent on equal footing
Encourage innovation w/ multi-platform competition	Undermines investment in alternative network (wireline & wireless)	No evidence that LLU slowed investment or innovation	LLU increased the total investments and innovation
Avoid unnecessary & inefficient duplication of component	Can enrich the new entrants at the expense of the incumbent operator	Competition increased the size of telecom market to benefit of all players. The key point is the speed of deployment	South Korean government used asymmetrical regulation including LLU. Such regulation made Korea the leading country in the OECD

Source: The OECD

Table 8. South Korean Online Gaming Business Model

	Purchase Price	Monthly Subscription	Initial Cost Recovery	Operational Cost Recovery	Strategies
S. Korea	Free download or free CD	\$20-\$30	Lowering initial costs by free software	Mainstream adoption	Pay-to-play & Free software
US	\$30-\$70	\$10-\$20	Retail sales	Monthly Subscription	Expensive software

Source: GIG Spotlight