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Network neutrality: Insights gained by juxtaposing the US and Korea

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Network Neutrality: Insights Gained by Juxtaposing the U.S. and Korea

Abstract

In this study, we compare and contrast the U.S. and Korea in the context of network neutrality, focusing on debates among stakeholders and regulatory approaches.

Interesting similarities and differences are highlighted by comparisons within the broadband ecosystem framework: government functions, histories, people's perceptions, regulatory approaches, legislative initiatives, and implementation. In Korea, there is an existing regulatory framework with suggestive guidelines that can be used to address net neutrality in a case-by-case fashion. The U.S. follows a regulatory approach by creating enforceable non-discrimination rules. Our findings suggest that the issue is not only complicated, but also as complex and vague as the parties' diverse interests are. We conclude that a careful combination of government coordination and market forces is an effective way to govern net neutrality.

Keywords: Network neutrality; comparative case study; Korea, the U.S.; broadband; competition

Network Neutrality: Insights Gained by Juxtaposing the U.S. and Korea

A debate over net neutrality (NN) debate has emerged over the last several years that has sparked heated debates in telecommunications policy in the U.S. and South Korea (hereafter Korea). NN is an issue around the world, but the developmental typology differs between countries. Originating in the U.S., NN has evolved differently in different contexts. Although NN has numerous facets, the fundamental idea behind NN is that every piece of content and every service over a network should be treated without discrimination (Hart, 2012). This principle advocates no restrictions by Internet service providers (ISPs) or government on content, sites, platforms, kinds of equipment that may be attached, or the modes of communication used (Lee & Wu, 2009). Although NN seems ideal, it is actually very complicated because it involves complex and contextual matters. In this highly dynamic context, research must contextualize the debate over NN to clarify the issues involved. It is important to analyze the issue from an ecological perspective, examining the dynamic relationships between stakeholders with multiple levels of social environment perspectives. Together with the ecological perspective, a comparative analysis investigates relationships among stakeholders, which provide essential insights into the ways that NN has been perceived, discussed, framed, and implemented (Cheng et al., 2012).

For the purpose of contextualizing the NN issue, we select the U.S. and Korea for a comparative case study, as these nations have taken the lead in broadband and information technology (IT) development and the issue of NN has been debated intensely. Given the paucity of comparative research on socio-political dimensions of NN, our

findings can provide policymakers with ideas to improve the practice of nationwide network implementation and development. Differences between the strategic initiatives of the U.S. and Korea are heuristically instructive for discussions of next generation network environments. The U.S. position on NN has garnered the most attention, as the U.S. spearheaded the NN agenda (Kraemer, Wiewiorra, & Weinhardt, 2013). At the same time, Korea's initiative is worthy of note because Korea has historically adopted U.S. initiatives and imposed them onto a very different economic and social system that is underpinned by a different legal structure. It is important for countries to clarify issues and resolve possible conflicts before NN is applied.

In this study, we address three core questions:

RQ1: How do national-level policy initiatives address the development of NN?

RQ2: How did the different goals and objectives of different countries contribute to patterns of development in industry and society?

RQ3: How do people perceive NN in different countries, and what are the implications of these differences for users and for the future of the Internet?

Two approaches to the study of NN are observed: comparative analyses (1) that seek to *ex-ante* determine the bounds of permissible conduct in markets and (2) case-by-case examinations that eschew direct interventions. In the U.S., although there have been a variety of policies, regulators have imposed rules in *ex-ante* fashion, under the assumption that the regulatory process is too slow to stop abusive practices before considerable damage occurs. In Korea, although whether there are patterns to the policies

applied is not clear, a case-by-case approach is applied that is similar to a wait-and-see approach in which regulators address problems only as they actually develop and then respond to specific instances of abuse. These strategies are examples of indirect coordination in an effort to eschew direct intervention.

These two approaches contrast sharply with Korea's previous broadband developmental typology. The Korean government has taken a highly interventionist and proactive role, whereas the U.S. government has acted as a facilitator to indirectly influence broadband growth. While these differences, within and between nations, may lead to the impression that NN is primarily about *ex-ante* and *ex-post* regulation, the most compelling question is how to equally address the universal service of public policy and to promote competition in industry – that is, how to use networks as tools to benefit the market economy and to promote democracy. For this challenging task there is no “one-size-fits-all” solution, as the level of complexity of the problem is ever-increasing. As Marsden (2010) argues, NN has potentially profound consequences that cannot be left entirely to market stakeholders, however neutral or benign their motives. This implies the need for a new approach, namely contextual regulation or co-regulation (Marsden, 2010). By affording a proactive role for government and a responsive role for industry with sanctions for oversight and omission, co-regulation is a balanced concept, or a middle way between state regulation and pure industry self-regulation. As Watal (2011) argues, co-regulation may represent smarter governance, as it resolves the problem of bandwidth scarcity without significantly undercutting incentives for application innovation or affecting consumers.

As shown in previous studies, neither *ex-ante* nor *ex-post* approaches work perfectly. In this study, we seek to identify a reasonable and sustainable balance between

regulatory and market-based means for allowing the Internet to evolve as an open platform of economic, political, and societal development in the future.

2. Literature review

Defining NN

While the precise meaning is a matter of debate, NN is a network design paradigm that argues for broadband network providers to be completely detached from the content that is sent over networks (Cheng et al., 2012). NN argues that no bit of information should be prioritized over another. NN proponents claim that telecom companies seek to impose tiered service models in order to control the pipeline and thereby remove competition, create artificial scarcity, and oblige subscribers to buy their otherwise uncompetitive services (Wu, 2003). They believe NN to be primarily important as a means of preserving current freedoms. On the other hand, opponents of NN characterize NN regulations as a solution in search of a problem, arguing that broadband service providers have no plans to block content or degrade network performance (Yoo, 2012). Critics of NN also argue that data discrimination, particularly to guarantee quality of service, is not problematic but is actually highly desirable.

As there is no universal form of NN, debates surrounding NN have varied across national contexts. NN discussions have been rooted in deep political, economic, social, and regulatory contexts. Therefore, it is necessary to approach NN in terms of contextual regulation.

Broadband ecosystems

NN should be discussed within the broader context of broadband policy, as NN addresses broadband sharing and competition. NN has direct impacts on broadband deployment, consumers, usage, investment, and innovation, all of which constitute the broadband ecosystem. More than just a technological network, broadband is an ecosystem comprised of elements that depend on high-speed connectivity to interact in different ways (Frieden, 2005). Kim (2009) conceptualizes broadband as an interconnected, multilayered ecosystem of high-capacity communications networks, services, applications, and uses/users. The broadband ecosystem includes networks that support high-speed data communication and the services these networks provide (Shin & Jung, 2012). It also includes applications provided by these services and users who create applications and content. Investments made by public or private investors and agencies, in addition to user demand, expand the reach of high-speed networks. These networks increase the availability of high-quality services to both users and application providers. Applications use these services to reach users, who in turn respond to the affordability of the services and relevance of the applications. Users then grow in number and sophistication, demanding and driving greater investment in networks, thus creating a virtuous circle for broadband (Choi & Kim, 2010).

As NN involves broadband networks, it is worthwhile to apply the broadband ecosystem perspective to the NN debate. In fact, ecological metaphors are commonly used in discussions of NN by both proponents and opponents (Heimann, 2011). Opponents argue that the environment for innovation must not be weakened by network owners and that regulators should focus on the “environment generated by technological innovation and regulation” and the “design of the media ecology” in order to guarantee

media access. Promoting competition throughout the Internet ecosystem is a key purpose of government policy. Opponents of NN also use the ecological metaphor assuming that market players have an obligation to find a new equilibrium to the benefit of the Internet ecosystem and society at large.

3. Methodology

We employed multiple methods in order to facilitate a contextual understanding of the NN issues in this study. Multiple hybrid methods are particularly suitable for addressing NN as issues in both the U.S. and Korea are very complex. The multiple sources of evidence used in this study are intended to increase the reliability and validity of our results by increasing confidence, strengthening their validity, and reducing methodological bias.

First, archival materials, such as industry reports, government publications, technical reports, and materials pertaining to NN, were collected and analyzed. Informal supplementary data were collected through phone calls, email, casual conversations, and faxes for clarification and follow-up. Secondary data were collected through a literature survey of existing government documents, white papers, industry reports, and media. From the archival data, records outlining a total of 289 events related to NN in Korea and a total of 251 events related to NN in the U.S. from 2000 through 2011 were collected. All data were cross-validated before use.

In the study, data from interviews and secondary sources were organized into basic themes, which were then compiled into organizing themes derived from the background literature. The creation of thematic networks to analyze data followed quite

naturally from the recognition of issues in the interview topic guide, data from secondary sources, and topics that arose organically during conversations.

A survey method was used for quantitative analysis. The survey was designed in order to identify people's views on NN issues in both study countries. Survey data were collected by a marketing firm that specializes in public opinion surveys. Headquartered in Seoul, the firm has branch offices in the U.S., and maintains robust panel data related to telecom policy. Over a five-month period, a total of 451 users (Korea 220; U.S. 231) were surveyed by the company in the primary language of each country. The English version of the questionnaire was translated into Korean and then back-translated into English to ensure comparability.

Respondents were asked to fill out the survey questionnaire, which was composed of 10 variables representing NN. The variables in the survey were drawn from a literature review (e.g., Crocioni, 2011) and expert suggestions (see Table 2 and Section 4 for variables). Respondents were required to score each variable on a 7-point Likert scale (from strongly disagree to strongly agree). Respondents were also asked to express their opinions about the government's role in NN. The mean scores were used to determine whether there were differences among respondents in different groups. After collecting two sets of data for statistical testing, one-way ANOVA was used to test mean differences among different groups. The ANOVA F statistic was calculated by dividing estimates of the variability between groups by intra-group variability: $F = (\text{variance between}) / (\text{variance within})$.

4. People's values in NN

The purpose of the quantitative analysis in this study is two-fold: (1) to closely examine how different stakeholders think about specific factors regarding NN, and (2) to further investigate how they view the role of government in NN across countries.

4.1. Analyzing different views of NN

The quantitative data reveal that people's views expressed in the survey are different for each component of NN and that these components or factors vary across countries. In general, respondents from both countries expressed a great deal of concern about practices of network operators that could force them to pay for Internet service providers they do not use, deny them the choice of a preferred provider, or slow or block Internet services or applications. They generally expressed support for the NN principle, but in different ways. Some expressed strong support; others showed balanced views on network investment and abuse of usage. Some respondents showed neutral opinions or vague opinions. Table 1 shows that positions toward NN are different between countries. The Korean respondents responded more favorable opinions than the U.S. respondents, while the U.S. respondents showed more neutral positions than the Korean respondents. Although the difference was not statistically significant, the U.S. respondents tended to have moderate views of NN, whereas Koreans views skewed in favor of NN. In general, while the U.S. responses were flat and moderate, the Korean responses were bipolar, being both pro and against NN. In general, the positions of Korean respondents were assertive and determinate.

Table 1

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Positions of respondents regarding NN

	The U.S.	Korea	Total
Pro	99	124	225
Con	82	86	168
Neutral	60	30	90
Total	240	240	479

Table 2 provides a detailed summary of views of all factors, including the mean and standard deviations of NN for pro/con individuals. The factors used in the study are drawn from Shin and Choo (2011), which was in turn based on previous research by Cheng et al. (2012) and Cheng et al. (2011). Proponents and opponents of NN from different groups are distinguished not only by their stances toward NN, but also by their values, indicating a connection between values and policy.

Table 2

The means and standard deviations of all factors

The U.S.						
Value	Standard deviation			Mean		
	Pro	Con	Neutral	Pro	Con	Neutral
Competition	0.294	0.431	0.493	5.31	4.13	5.23
Bandwidth availability	0.292	0.342	0.222	3.01	4.12	3.78
Investment and innovation	0.321	0.362	0.642	6.05	3.92	4.02
Equality	0.623	0.356	0.353	3.24	5.24	4.11

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Freedom	0.265	0.334	0.372	6.18	3.91	4.16
Control of data	0.096	0.314	0.363	3.32	5.03	4.18
Quality of service	0.672	0.022	0.293	4.91	4.01	3.30
Korea						
Value	Standard deviation			Mean		
	Pro	Con	Neutral	Pro	Con	Neutral
Competition	0.199	0.191	0.192	3.32	5.29	3.38
Bandwidth availability	0.193	0.291	0.102	5.01	3.12	3.99
Investment and innovation	0.229	0.222	0.292	4.05	4.93	4.02
Equality	0.424	0.276	0.263	6.24	3.10	4.01
Freedom	0.167	0.224	0.284	4.18	5.91	4.06
Control of data	0.092	0.124	0.282	5.32	2.03	4.98
Quality of service	0.173	0.012	0.198	3.91	3.01	3.90

For *tests of mean differences among the groups*, chi-square difference testing was used to test the significances of the means of the groups (Table 3). Two models were run, one with parameters free across groups, one with parameters fixed across groups. There were significant differences among the means of the three groups.

Table 3

Chi-square test results

	Value	df	Asymp Sig.
Pearson chi-square	17.246	3	0.000

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Likelihood ratio	18.531	3	0.000
Linear-by-linear association	10.515	1	0.000

4.2. Dissecting NN: Factor analysis

This section provides an overview of factors within the NN discourse that arise during dialogues such as interviews, phone calls, email, and documents.

Table 4

Perceived factors of net neutrality

Factor	Description
Non-discrimination	The principle is to prohibit service providers such as KT and SKT from using their network resources to prioritize data as it crosses their networks to improve the performances of specific applications.
Freedom (digital rights and freedom)	NN ensures that the Internet remains a free and open technology, fostering democratic communication. Over-freedom regarding digital content use on the Internet is harmful to content creators because it decreases their incentives to create new content.
Competition and unbundling	Competition can mitigate NN concerns because users may simply switch providers if they do not like the way a certain provider manages network traffic. The question remains as to the types of competition that should be emphasized and how much competition should be allowed regarding the Internet.

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Control of data	A legal mandate should ensure that ISPs and network operators allow content providers free access to their cable lines, referred to as a <i>common carriage agreement</i> .
Quality of service	With the emergence of convergence services, such as VoIP, IPTV, and other applications that benefit from low latency, attempts to address the inability of some private networks to limit latency have arisen, including the offering of tiered service levels that shape Internet transmissions at the network layer based on application type.
End-to-end principle	This principle states that, whenever possible, communications protocol operations should be defined to occur at the end-points of a communications system, or as close as possible to the resource being controlled.
Innovation and investment	Arguments remain over how much prioritization of bandwidth is allowed for future innovation on the Internet. Telecom providers may provide preferential treatment in the form of tiered services. The added revenue from such services could be used to pay for increased broadband access to more consumers.
Bandwidth availability	One of the main arguments of the opposition is based on limited bandwidth availability. With new technologies in place, Internet traffic has increased drastically. Network providers argue that they should have the right to charge fees to portals and smaller companies offering free video content using substantial amounts of

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	bandwidth.
Opposition to additional legislation	There is doubt with respect to the government’s ability to make and maintain meaningful regulations that do not cause more harm than good. Telecom network providers argue that telecom has already been heavily regulated and do not want additional legislation.

Based on the factors identified above, we designed a factor analysis of neutrality. A one-way ANOVA was used to test for differences in means among the three groups. Table 5 shows the variance between groups and within groups. For non-discrimination, the significance level of 0.000 signifies that there are significant differences in the mean responses between different groups ($F(9, 244) = 9.014, p=0.113$). There are also significant differences in the means of freedom between the pro group and con group at the $p < 0.05$ level ($F = 7.321, p= 0.000$). Likewise, other variables (opposition to legislation, counterweight, control of data, and bandwidth availability) show significant differences in means among groups. However, significant differences were not detected for five factors, freedom, competition and innovation, quality of service, end-to-end principle, and investment, which implies that all three groups agree that these five factors are important.

Table 5

One-way ANOVA of group differences

Factors		SS	df	MS	F	Sig.
Non-discrimination	Between groups	1.339	9	0.232	9.125	0.002

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(Equality)	Within groups	41.923	235	0.199		
Freedom	Between groups	0.152	9	0.074	0.113	0.000
	Within groups	13.144	235	0.245		
Competition and unbundling	Between groups	0.293	9	0.073	0.022	0.003
	Within groups	16.291	235	0.112		
Control of data	Between groups	1.355	9	0.317	5.332	0.004
	Within groups	21.344	235	0.142		
Quality of service	Between groups	1.353	9	0.324	0.113	0.297
	Within groups	42.851	235	0.281		
End-to-end principle	Between groups	0.389	9	0.154	0.110	0.235
	Within groups	25.482	235	0.168		
Investment and innovation	Between groups	0.345	9	0.157	0.103	0.005
	Within groups	23.515	235	0.159		
Bandwidth availability	Between groups	2.161	9	0.530	5.232	0.090
	Within groups	12.612	235	0.248		
Opposition to legislation	Between groups	2.162	9	0.520	6.013	0.013
	Within groups	42.225	235	0.428		

*SS: sum of squares; MS: mean square

4.3. Summary of the ongoing discussion

With different patterns and foci, the issue of NN has become a major debate in both countries. The essence and focal issues of the U.S. neutrality discourse differs substantially from that of Korea. While the U.S. respondents perceive NN from the

context of increasing competition and thus discuss it from a broader social and economic perspective, Korean respondents see it within a dichotomous frame between regulation and competition. Reflecting this difference, the most important factors to U.S. respondents were transparency and non-discrimination in NN, while Koreans see equality as the single most critical factor. This difference corresponds to actual regulatory trends; the U.S. aims to preserve the open characteristics of the Internet and ensure user rights to access lawful content, run lawful applications, attach lawful and non-harmful devices, and to have competitive alternatives. To Korea, the main issue is how to distribute broadband resources and how to share the network. Although Korea has made a long-term and consistent commitment to building broadband, NN has faced severe obstacles.

5. Government roles

Given the different formats in both countries detected by the factor analysis, we believed that it was worthwhile to further investigate their perception in regard to the role of government in NN. This view provides valuable insights, as the role of government is becoming more and more critical in the debate over NN.

5.1. Differing views and expectations of government

Most respondents in both countries viewed the government as the single most influential body to help bring countries into the network society, with its main responsibility being to build and provide a general infrastructure for IT. Regarding the specific approaches of government, however, respondents in the two countries showed differing views on the role of government (Table 6). While the Korean respondents

tended to expect government to offer proactive interventions, their U.S. counterparts tended to think of government as a facilitator. Korean respondents expected the government to play a central role in shaping network policies and strategies. The Korean respondents ascribed the successful, rapid rollout of broadband in Korea to the Korean government's active and intervening policy. Korean government officials expressed confidence in applying the broadband success mechanism to the current NN policy.

Other Korean respondents talked about the proactive role of government having a positive economic impact. These respondents, mainly from industry, supported the government's role in network development. They identified a close relationship between government and industry. As one business manager with a leading IT company commented, "It is part of our business culture to listen to the government." The guidance provided by the government has been acted upon by the companies active in each sector. Respondents from telecom carriers indicated that they regarded broadband as an opportunity to develop new markets. One interviewee stated, "We should create a new market that does not yet exist." He continued, "We see smart devices like smart TVs as a killer application." The respondents saw broadband as a governmental support, or subsidy, to develop new technologies, and as a way to commercialize them. This view is in line with those of the government official who said, "For broadband, we use industry as our partner to develop new technologies for cash-cow."

On the other hand, respondents from the U.S. rather divergent opinions as to what role the government should play with regard to network and governance. Respondents from academia and civil groups emphasized an expanded federal role in supporting the development of broadband. This group is characterized as recommending the government

to act as an intervener. Many industry representatives believed that government support for broadband are appropriate to lay a foundation for long-term economic growth and national leadership. They expressed the opinion that competition drives the benefits of networks, and that government has a responsibility to ensure the expansion of networks, including appropriate *ex-ante* regulation, if necessary.

In an email exchange, one college professor called on the government to develop milestones for broadband development, to promote industry-developed interoperability standards through government purchases of network-related equipment and services. He also emphasized that broadband is not just that high-speed expands, but also what it enables. How networks enable the future educational system, enable the expansion of capabilities for Americans with disabilities, and ensure diversity, localism, and speech are basic underpinnings of the responsibility of government.

The other group of U.S. respondents, mainly from industry, saw the government as an indirect facilitator. They called for the reduction, or even the elimination, of the federal government's role in broadband. They pointed to current private sector initiatives, the deregulation of the U.S. telecommunications industry, and a reduced federal role in the management of telecommunications policies, and argued that expanding the federal role was not appropriate. They agreed with the idea of a government-guided, but a society/market-led framework. One perspective is that government should take a hands-off approach, because broadband is an ICT in which practice tends to precede regulation. The other perspective emphasizes that while a *laissez faire* policy toward ICT can be good, a minimum regulatory safeguard is needed to ensure fair competition and to prevent network owners from abusing network sharing. Broadband networks defy

centralized structures, and the ICT sector remains a high-growth area, which tends to increase business pressure for a *laissez faire* approach by government. One researcher noted, “The government has consistently pursued telecom policies for competition, based on deregulation and market principles, since the early 1980s. NN should be resolved by the same principle of market-driven initiative.”

Different expectations of the role of government may be related to different perspectives on NN. Korean respondents appear to see NN from the perspective of industrial policy and government intervention. In line with this view, the Korean respondents tend to emphasize traffic management and equality issues. The capacity of industries to innovate, and hence produce and adapt new technologies, is largely influenced by the ability of governments to mobilize and attract both financial and technological resources. On the other hand, the U.S. respondents tend to stress the competition and transparency (open Internet) aspects of NN, and believe that governments play a facilitating role in coordinating NN for open Internet. The differences between the two countries’ responses shed light on a fundamental difference that is deeply rooted in the political cultures of the two countries.

Table 6

Responses regarding the government’s role in NN

Korean respondents		Responses	Responses	Percentage
Proactive intervener	Controller	15	60	61.3%
	Builder	18		
	Regulator	16		

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	Investor	11		
Facilitator	Strategist	5	38	38.7%
	Guider	7		
	Leader	9		
	Integrator	7		
	Total	98	98	
U.S. respondents		Responses	Responses	Percentage
Proactive intervener	Controller	4	24	32.8%
	Builder	7		
	Regulator	9		
	Investor	4		
Facilitator	Strategist	12	49	67.2%
	Guider	13		
	Leader	11		
	Integrator	13		
	Total	73	73	

6. The historical background of NN

We traced the history of each broadband to see how past trajectories influence the current NN debates, and how the role of government has changed over time. We investigate how historical, political, and economic forces have influenced NN debates, and how these forces will shape the development of future NN. In so doing, the

background and drivers that have pushed NN to the forefront of telecommunications policy become clear.

6.1. Korean broadband policy

The Korean government has been heavily involved in fostering broadband adoption, and has provided several key characteristics with respect to regulatory regimes, infrastructure supply, demand promotion, and institutional configurations conducive to policy execution (Shin & Jung, 2012). Since 1996, the Korean government has established a series of master plans for the development of an information society (Table 7).

Table 7

Korea’s broadband initiatives

Year	Initiative
1996 – 2000	First National Informatization Promotion Plan
1999 – 2002	Cyber Korea 21
2002 – 2006	e-Korea Vision 2006
2003 – 2007	Broadband IT Korea Vision 2007
2006 – 2015	U-Korea Master Plan
2006 – 2010	Phase 1
2011 – 2015	Phase 2

Technically speaking, broadband growth in Korea has been impressive. Indeed, the country has seen a significant transformation, from less than 1 Internet user per 100 inhabitants in 1995 to one of the world's most highly penetrated broadband markets. By June 2011 fixed broadband penetration was 51 percent, and market penetration of 4G services was 62 subscribers per 100 inhabitants (Shin & Jung, 2011).

Kim, Kelly, and Raja (2010) regard Korea to represent emerging best practices in approaching broadband as an ecosystem, and argue that Korea has been highly successful in spurring rapid growth of broadband. Korea's exceptional success in developing broadband and ICT reflects a unique mix of highly competitive private-led markets and government leadership, use, support, and regulation. This situation comprises a unique balance between cooperation and governance. The Korean government has intervened in many ways in the broadband market, but did so in a focused and strategic manner. The government's actions were critically important to trigger or guide private sector development and tie it to the government's sector objectives and particular country conditions.

The Korean government's holistic approach to broadband development has been particularly effective. A number of factors drove the successful promotion of broadband in Korea, including (1) the government's long-term strategic planning; (2) liberalization of the telecom market and the creation of a highly competitive environment; and (3) demand-side drivers including low broadband pricing.

The Korean government's regulatory policies have also been successful, particularly in terms of increasing competition in the broadband market. Interestingly,

this successful policy has not been addressed in the NN debate. The Korean government's position toward NN remains obscure and sometimes confusing.

6.2. The broadband policy of the U.S.

Unlike Korea's proactive policy, the U.S. approach can be characterized as market-oriented and deregulatory (Hart, 2011). Compared to Korea, the U.S. has lagged in broadband growth. Accordingly, the U.S. government has begun to develop its first national broadband strategy. This marks a significant shift in the country's approach to broadband—from a *laissez faire* strategy to a more state-directed and public-private partnership approach. Existing competition in the market and a large user base create significant opportunities for expansion. In June 2009 fixed broadband penetration in the U.S. was 28 percent and the market penetration of 3G services was 34 percent. In contrast to its early, active, and effective incubation of the Internet through subsidies and promotion, the U.S. government did not apply broadband interventions used by other nations until 2009. The lack of involvement and public underwriting contrasts with the fact that the U.S. long ago established an expensive and comprehensive universal service funding mechanism to promote access to affordable narrowband Internet service. In 2009 public fiscal support for broadband totaled \$7.2 billion and was part of the economic stimulus package developed in response to the recent economic crisis.

The lack of government leadership is one reason the U.S. lags behind Korea in broadband development. Part of the reason for the deregulatory approach is that broadband services have historically been regulated differently according to the technology by which they were carried. The FCC has taken a segmented approach to

regulating different communications media, as outlined by the Communications Act I (Ohlhausen, 2013). There have long been calls for the U.S. government to play a more active role in promoting broadband. But the U.S. stuck with a deregulated approach, assuming that the market would build enough capacity to meet the demand. This model did not lead to the expected results because it failed to link the short-term profitability of service providers with the long-term macroeconomic benefits of widespread access to high-speed, low-cost broadband. The 2008 change in administrations, concerns about deteriorating global competitiveness, and the recession of the late 2000s led to a rethinking of this strategy. The economic stimulus plan, which marks a change in the role of the public sector, provides the staging ground for a revised broadband strategy. The strategy being prepared and operated by the FCC aims to facilitate and expedite the development and use of high-speed broadband infrastructure. It is interesting to observe that the FCC approach in broadband has changed in the NN debate.

The cases of Korea and the U.S. show a clear contrast in broadband policy: a proactive, intervening approach versus a market-driven approach. Interestingly, this difference emerges in opposite ways in the NN case. While Korean government has been fairly proactive and interventionist in broadband development, it has been hands-off or *laissez-faire* in the NN debate. On the other hand, the US government has played a role as a facilitator or observer in broadband, whereas it has played a proactive role in NN by regulating *ex-ante* rule and by actively ensuring public interest.

7. The status of the regulatory debate

As the next step of the analysis, the process of the NN debate is discussed to understand NN from the perspective of a contextual ecology.

7.1. Legislative efforts in Korea

The Korean government enacted the Electronic Communications Business Act in 1999 with the goal of promoting e-commerce. The act defines broadband service as facility-based. Owners of the facility have the responsibility to share the facility with reasonable fees. Since its inception, this act has served as a basic rule of NN. Although NN requirements have been enacted through the act, conflicts with smaller ISPs and content providers have continued (Shin & Han, 2012). Conflicts occur in the areas of pricing and privacy. While pricing problems stem from negotiations between companies and may eventually be resolved, privacy is a more serious issue that should be given further consideration (Ohm, 2010).

Realizing these recurring problems, the Korean government enhanced NN by introducing another regulation, the Internet Multimedia Broadcasting Business Act. The act passed the National Assembly in 2008 and introduced IPTV operation to define NN in a weak manner, requiring open access and non-discrimination from the network or platform operator. The act advances fair competition and consumer protection as policy goals.

A more specific and direct provision of NN was introduced in 2011, as more frequent conflicting cases have occurred since 2011 (Table 8). The government has attempted to improve NN by requiring telecommunications operators to further open their fixed-line and wireless networks. A component of the *Plans for 2011* (KCC, 2011)

includes “activating competition in the communications market by advancing broadcasting industry, increasing the public functions of broadcasting, preparing political measures for NN and converting consumptive marketing expenses to future investment.” This plan provides the basis for mobile virtual network operators and other policies to revive industry vibrancy and ensure fair competition between different platforms.

In addition to governmental efforts, the Citizens’ Coalition for Economic Justice, Open Web, and other civic-minded organizations formed the Network Neutrality Forum on May 2, 2013. This forum is designed to highlight public concerns about the NN policy debate and represent citizens’ voices in the decision-making process. The forum incorporated a consultative committee, discussing traffic management guidelines. Based on the conclusions of this forum, the KCC subsequently published NN guidelines. The main contents of the guidelines include user rights, transparency of traffic management, no blocking, no unreasonable discrimination, and reasonable traffic management. However, the National Assembly is preparing to address NN in the near future, as the NN guidelines have not been working effectively. The new NN bill is garnering more attention in the public sphere than previous legislation attempts, and could signal a new battle between NN proponents and opponents.

Table 8

Recent NN timetables in Korea

Date	Event – time line
05. 04. 2011	- Korea Communications Commission (KCC) held a forum, “Establishment of net neutrality policy forum”

COMPARATIVE NET NEUTRALITY

<p>12. 05. 2011</p>	<p>- The Korea Information Society Development Institute announced net neutrality guidelines: 1) user rights, 2) transparency, 3) no blocking, 4) no unreasonable discrimination, 5) rational traffic management.</p>
<p>12. 26. 2011</p>	<p>- The KCC announced net neutrality and Internet traffic management guidelines that were neither realistic nor effective for solving blocking mVoIP or smart TV blocking related problems.</p>
<p>02. 10. 2012</p>	<p>- KT blocked Samsung Smart TV's connection (before the first discussion by the KCC, which was to be held five days later). Samsung Electronics sought an injunction against KT.</p>
<p>02. 14. 2012</p>	<p>- KT unblocked the Samsung Smart TV connection. - Samsung Electronics withdrew its injunction.</p>
<p>02. 16. 2012</p>	<p>- First net neutrality policy advisory committee</p>
<p>05. 04. 2012</p>	<p>- The KCC warned KT that "violating user agreements and Telecommunications Business Act." - The KCC recommended that Samsung actively participate in discussing net neutrality. - Conditionally allowed the entry of MVNO.</p>
<p>07. 13. 2012</p>	<p>- The KCC announced guidelines regarding reasonable management and usage of networks: the net operator gained leadership of traffic management.</p>
<p>07. 18. 2012</p>	<p>- The Open Internet Association opposed the guidelines, which are therefore being postponed.</p>

01. 25.	- In late 2011, KCC introduced net neutrality guidelines.
2013	<ul style="list-style-type: none"> - In 2012, a net neutrality policy advisory committee was formed. - In 2013, a new administration took office, and the KCC will form a net neutrality consultative group.

7.2. Legislative efforts in the U.S.

In the U.S., proposals for NN laws have been opposed by the cable and telephone industries, and by network engineers and free-market scholars from [conservative](#) to [libertarian](#) groups (Powell & Cooper, 2011). By late 2005, NN regulations were included in several Congressional draft bills, as parts of ongoing proposals to reform the Telecommunications Act of 1996. These bills generally require Internet providers to allow consumers access to any application, content, or service. However, important exceptions allow providers to discriminate for security purposes, or to offer specialized services like broadband video service. These regulations prevent ISPs from offering different service plans to their customers.

In April 2006, a large coalition of public interest, consumer rights, and free speech advocacy groups launched the SavetheInternet.com Coalition, a citizen-based initiative working to ensure that Congress passes no telecommunications legislation without meaningful and enforceable NN protections. Within two months of its inception, over 1,000,000 signatures were submitted to Congress in favor of a NN policy. By the close of 2006, the site had collected more than 1.5 million signatures, effectively stalling legislation in Congress that did not write NN protections into law.

The two proposed versions of NN legislation prohibit: (1) the tiering of broadband through sale of voice- or video-oriented Quality of Service packages; and (2) content- or service-sensitive blocking or censorship on the part of broadband carriers. NN bills are referred to the Senate Committee on Commerce, Science, and Transportation. In the House, Representative Markey has also discussed reintroducing a NN bill, and such a bill was reintroduced in 2009.

Currently, the U.S. regulatory debate is centered on the merits of NN requirements. Through NN, the U.S. seeks to prevent broadband providers from abusing bottleneck positions. By and large, the FCC has consistently ruled in favor of NN, and four principles can be summarized throughout these rulings: (1) Consumers are entitled to access of lawful content; (2) Consumers are entitled to use applications and services of their choice; (3) Consumers are entitled to connect peripheral devices that do not harm the network; and (4) Consumers are entitled to competition among providers. The FCC's position is in line with President Obama's announcement (Obama, 2011), "keep the Internet as it should be - open and free." With the support of the President, the FCC is trying to extend these policy principles with two new efforts. However, the FCC has had significant problems attempting to codify and enforce actionable, legally binding rules. On January 15, 2014, the U.S. Court of Appeals for the District of Columbia threw out the FCC's NN regulations, saying that the FCC's 2010 order that imposed NN regulations on broadband services is illegal. This ruling is a counteraction against FCC's *ex-ante* drive and has significant implications for the evolution of the future Internet. With the ruling, it is most likely that current NN will change.

8. Market perspectives

While the NN debate tends to lean toward access network issues, it is important to see the market in relation to NN as the issue is inherently based in market dynamics.

8.1. The U.S. market

In the U.S., the market for residential broadband has grown. In the early- to mid-1990s, there were hundreds of small, regional ISPs providing dial-up Internet access using the PSTN. Since the introduction of cable modem service in 1997 and DSL in 1998, these small ISPs have disappeared. In the U.S., there has been significant debate on the intensity of competition in broadband access networks. The competitive situation in the market for broadband Internet access in the U.S. is frequently referred to as a duopoly. According to the FCC's National Broadband Plan, 96% of all households are served by two or fewer providers.

The decline of competitive broadband alternatives for consumers was coincident with an aggressive deregulatory period. At this time, NN emerged as a hot issue in the U.S. market, and the FCC effectively abandoned its historic procompetitive regulatory philosophy in favor of a deregulatory stance that is in effect pro-incumbent. Beginning in 2002, the FCC began to remove unbundling requirements from incumbent telecommunications carriers, which allowed competitors to obtain the necessary network elements to provide broadband Internet access. Similarly, prior to 2005, telecommunications firms in the U.S. were not permitted to discriminate by law. This restriction was removed in 2005, putting telecommunications firms on par with cable operators who were likewise not restricted. Therefore, U.S. regulators no longer have explicit power to regulate broadband Internet service. The FCC rulings of the past few

years have placed broadband Internet access into the category of an unregulated information service. In January 2014, the US Court of Appeals for the District of Columbia ruled that the FCC's open Internet regulation is illegal. While the court deemed that the FCC's open Internet rules were based on faulty logic, it requested the FCC to revise its arguments regarding NN and open Internet.

The U.S. broadband markets comprise a series of *de facto* duopolies or oligopolies, with no effective competition based on granting competitors access to end-users via Local Loop Unbundling, shared access or bitstream access. Thus, consumer choice is severely limited. In the absence of obligatory imposed rules, the FCC has no ability to prevent or remedy threats to NN.

8.2. Korean market

Broadband access service in Korea is provided by three national operators, KT, SK Broadband, LG U+, as well as many local operators, most of which are cable system operators. With these players competing to obtain and maintain subscribers, competition tends to be strong. Considering the growing competition in the market, KCC announced in December 2009 that there was no significant market power operator in the market, which led to *ex-ante* price regulation on KT broadband access service being lifted for the first time since 2005. The competition in the market has recently focused on selling TPS or QPS including IP/Cable TV, VoIP, and mobile services. The total number of broadband subscribers reached 16.8 million as of June 2010. More than 80% are shared by the three national operators, KT (42.8%), SK Broadband (22.6%), and LG U+ (15.7%). The mobile Internet service market has grown rapidly, since smartphones have gained

quickly in popularity since 2011. KT once reported that only 5% of users cause 50% of the entire traffic on its network, 88% of which is of P2P file sharing (Kim, 2009).

Measured by average broadband monthly price per advertised Mbit/s as of October 2009, broadband prices in Korea are the lowest among OECD countries at USD 1.76.

One constraint to providing broadband access service in Korea is flat rate pricing. The telcos have maintained intact flat rate pricing and would have little choice but to keep doing so for the foreseeable future. A very competitive market environment is one that forces it. However, this situation is also due to the bad experiences of KT when it tried to introduce usage-based pricing back in 2004 and 2005. There was an extremely harsh resistance of broadband users against the proposal, so that “usage-based Internet pricing” became literally eliminated in Korea. Such aversion for usage-based Internet pricing is probably due to the fact that the proportion and influence of heavy users are especially high in Korea relative to other countries. For instance, a great number of on-line gamers and middle/high school students watching on-line lectures were benefiting from flat rate pricing. This is a very strong constraint on possible solutions to NN problems in Korea.

The public debate about NN intensified in 2006 when several cable broadband providers blocked traffic from HanaTV, a new Internet video-on-demand service, claiming that it caused excessive traffic. However, many users claimed that the speed of most Korean networks could easily handle the traffic and that the block was motivated by a desire to prevent HanaTV from competing with cable television offerings. The debate intensified in 2012 when KT announced that it would restrict the usage of smart TVs, as they consume five to 15 times more data and, in the case of real-time streaming, hundreds

of times more data than regular TVs. A similar incident occurred in 2013 when Kakao, a mobile messenger provider, began a free mobile VoIP service using a wireless network.

This move sparked vehement opposition from mobile carriers.

Table 9

Comparison of market factors of NN

	Korea	The U.S.
Content providers	Weak	Strong
Market structure	Oligopoly	Competitive
Mid-tier competitiveness	Weak	Strong
Retail ISP	Competitive	Oligopoly
Bargaining power of cable operators	Weak	Strong
Investment initiated by	Government and private	Mostly private firms
Legislation	Legislated	<i>Ex-ante</i> rules
Main issues	Access, interconnection, significant market power, non-discrimination,	Access by local ISP, non-discrimination

Source: Kim (2009)

9. Discussion

With the ecology framework in place, we contextually compared the NN debates between the U.S. and Korea. Comparative analysis helps foster a better understanding of how the NN principle can be reconciled with the changing market and technological

environments. The two countries have faced similar NN concerns and problems, although in varying degrees of severity. They have applied different approaches to the problem with different consequences. They have also had inconsistent approaches, making it difficult to discern patterns and perform one-to-one comparisons. By and large, U.S. regulators have attempted to impose rules that *ex-ante* determine bounds of permissible conduct by IP-based networks. In Korea, a case-by-case approach that includes guidelines of acceptable practices and regulates competition has been implemented. Korea's approach is at times characterized as the lack of formal, specific rules, and broad authority granted by the law to the government. While proactive competition regulation emphasizes the intervening role of government, Korea's approach shows differently in the NN case leaving obscured and unmanaged situation at times. Occasional or sporadic problems related to NN might be addressed *ex-post* through the exercise of competition law, but this approach may create further problems if conflicts are not resolved in a fundamental manner. In the U.S., a key regulatory philosophy has been to regulate only when necessary to address market power. This philosophy has been applied to NN cases, and several substantive themes can be drawn from the NN approach. As Powell and Cooper (2011) summarize, these themes include (1) free speech and democracy (discussion of the impact of neutrality on free speech and democracy); (2) innovation and investment (arguments addressing the balance of innovation and investment at the core and edges of the network); (3) competition and market forces (discussion of the role of competition and market forces in determining the necessity of regulation); and (4) history and precedent (arguments pointing to the Internet's technical or regulatory foundations as justification in favor of or against neutrality).

By juxtaposing the two cases, it becomes clear that the network problem is far too complicated for even the most sophisticated regulator to craft a single set of meaningful rules to enforce a NN solution. It is unlikely that a single set of *ex-ante* or *ex-post* rules would effectively address all of the challenges presented by NN without running the risk of over-regulation (Crocioni, 2011). The market must be empowered to constrain behavior in the most economically efficient way. For this, a clear statement of acceptable carrier and subscriber behavior is needed, and must be facilitated by governmental supervision. However, when competition is imperfect, there will be the need for regulatory intervention. Since NN is a subset of ongoing competition issues, efforts to address NN should focus on solving the underlying lack of competition, not one-off network traffic management solutions. NN is an on-going issue, and a more fundamental long-term solution is necessary.

10. Conclusion

Our findings reveal different patterns of the debate, shedding light on insights for the next generation of Internet environments. The differences between national approaches provide a way to understand both contextual differences between regulatory cultures and substantive differences between policy interpretations. The underlying tensions between fundamental values and regulatory responsibilities that have fuelled the NN debates in both countries are unlikely to disappear or be mitigated for the time being.

Our analysis in this study reveals that NN governance is an outcome of contextual interactions of regulation, broadband, market, and users. NN is not a final deliverable or a certain status; it is an ongoing process with a goal of making society and markets

equitable and sustainable platforms for competition and innovation. Given the complexity embedded in nature, there is no “one-size-fits-all” solution to NN. While our analysis confirms this position, the results of our analysis leave more questions than answers. It remains difficult to describe *ex-ante* what a serious violation of NN is. In the same manner, it is also not easy to correct problems with *ex-post* tools that have already occurred and thus seriously damaged the market. As an anticipatory government intervention, the U.S. approach may assume the likelihood of misconduct and thus a need to resort to preventive government measures. By remedial government intervention, Korean government has utilized regulatory restraint and punitive intervention when bad conduct materializes. While it is difficult to make general concepts actionable or enforceable regulations, this difficulty inherently relates to differences in perceptions of NN, which in turn are deeply rooted in society and people’s perceptions. Thus, wide variation in the definition of NN creates ambiguous notions of effective competition. Managing competition in harmony with public interest is challenging where there is an entrenched, powerful incumbent, as in Korea and the U.S. This situation leads to politicized rulemaking and even regulatory capture in both countries. In addition, both markets change too quickly for administrative or legislative management, making effective competition the best remedy.

To conclude, any effective regulatory strategy to addressing NN may comprise a broad spectrum of approaches, including *ex-ante* principles, pre-specified guidelines for acceptable practices, and precompetitive regulation. Regulators should be focused on introducing or reintroducing effective, sustainable competition. Both governments should not view NN from the dichotomy of logic between competition and regulation, but rather

seek strategies that create and maintain the broadband ecosystem by encouraging diverse users, more network providers, more service providers, and more content suppliers to join the ecosystem. As the NN debate has brought the battle over the broadband ecology of the smart environment to the surface (Heimann, 2011), the issues require constant and coherent realignment, making NN a long-term project for sustainable ICT ecology.

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