

The impact of competition on universal service in Korea: A case study

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Abstract

A substantial body of theoretical and case study literature exists about the relationship between competition and universal service in developing countries. On the one hand, many scholars have argued that state-owned monopolies in developing countries are not able to mobilize the capital needed for network expansion: the resulting unmet demand for services becomes a motivator for liberalization. On the other hand, the introduction of competition jeopardizes the internal and external subsidies through which the state-owned monopoly kept subscription rates low: the heightened concern about loss of subscribership incentivizes the creation of explicit universal service statutes and funding mechanisms concurrently with or soon after competition is introduced. We show in this case study that universal service in Korea had a unique evolutionary path, which did not conform to either of these expectations. We argue that the outcomes predicted by theory and observed in the case study literature are not intrinsic to the monopoly condition per se, but derive from the strategic choices made by telecommunications managers, regulators and lawmakers in developing countries.

KEYWORDS: universal service; Korea; network growth; competition; liberalization;
Korea Telecom

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Introduction

Since the 1980s, a broad consensus has emerged in the literature that the introduction of market-oriented reforms is the most effective means to achieve telecommunications objectives such as productivity and efficiency, network expansion and universal service (e.g., Bhuiyan, 2004; Fan, 2005; Garbacz & Thompson, 2007; Mueller, 1999; Ros, 1997; 1999; Stehmann, 1995; Wallsten, 2001). Developing countries seeking operational efficiency and network growth are encouraged to introduce market-oriented reforms, such as competition and privatization, which are expected to solve the inherent problems of a state monopoly. Accordingly, most major developing countries have implemented some form of reform in the past two decades, dismantling monopoly state ownership and control over telecommunications.

In this paper, our primary concern is with the impact of competition on universal service. Theoretical explications and cross-national comparisons have been conducted over the past two decades, assessing this relationship. These case studies reveal a general “pattern” to the process of reform (Bhuiyan, 2004; Cowhey & Klimenko, 2000; Gillwald, 2005; Mattos & Coutinho, 2005; Serafica, 1996). Typically, calls for reform are initiated when state monopolies in developing countries fail to meet residents’ demands for telecommunications service because of their inefficiency and the lack of financial resources for network investment (see in general, Wallsten, 2001; Cowhey and Klimenko, 2000). These consumer demands for better service are accompanied by pressure from private investors, domestic and international, for investment opportunities in markets that

are seen as lucrative. Under these influences, the government opens the telecommunications sector to private capital either through privatization of the state-owned operator, or by allowing private telecommunications carriers to enter competitively with the incumbent. Universal service, which is often conceptualized as a “social” objective, is typically not high up in the priorities in this first phase of reform, which is principally motivated by pro-market considerations. However, the first phase often involves increases in subscriber rates to attract private capital, and rate rebalancing and removal of cross-subsidies to prepare the incumbent monopoly for competition (Mattos & Coutinho, 2005). Widespread fears that universal service may be sacrificed for economic efficiency tend to ignite discussions of universal service (Jayakar, 1999; Mueller, 1997). Any ad hoc universal service system that may have existed earlier is replaced by an explicit, transparent and competitively neutral support mechanism for low-income subscribers or high-cost areas. Though individual countries may differ in significant ways from this typical pattern, the general process is repeatedly observed in countries as different as, for example Brazil (Mattos & Coutinho, 2005), Chile (Stehmann, 1995), India (Petrizzini, 1996), South Africa (Gillward, 2005) and Bangladesh (Bhuiyan, 2004).

These patterns of telecommunications reform, typical of most developing countries, are not evident in the case of South Korea (hereafter referred to as Korea). As we shall show in the paper, Korea was able to achieve substantial network penetration during the monopoly period, contrary to the experience of other developing countries and the expectations from theory. Second, the introduction of competition was an abnormally prolonged process in Korea occupying the better part of a decade. But it was not

accompanied by demands for a new universal service system, contrary to the experience in other developing countries where competition led to the end of the incumbent monopoly's cross-subsidy support for local service and contributed to demands for a new competitively neutral universal service system. Instead, in Korea, demands for a new universal service system emerged only in the late 1990s, almost a decade after competition was introduced. Moreover, the universal service mechanism that appeared in 2000 was still not competitively neutral. It imposed the obligation of universal service largely on the incumbent, Korea Telecom. Also, despite the lack of specific universal service funding mechanisms, Korea initiated an ambitious universal service program for broadband from the mid-1990s—many years before more developed economies took a similar step.

In light of these anomalies, several questions may be posed. How was Korea able to dramatically expand the network in the state monopoly period without significant private capital investment? In introducing competition, why did the Korean government adopt a deliberately slow and phased manner, despite enormous pressure from international actors? Why did Korean universal service policy, for long administered by government fiat, suddenly acquire a legal foundation and a systematic framework in the late 1990s? In contrast to the experience of many countries, why was Korea so quickly able to develop a universal service policy for broadband? Again in contrast to most other countries, how was Korea able to build rural broadband networks almost simultaneously with networks in urban areas? How did the introduction of competition and privatization change the dynamics of universal service policy-making?

To find answers to these questions, this paper investigates the introduction of

competition in Korea and its relationship to the evolution of a universal service system. We build on a substantial case study literature on telecommunications reform in Korea (Choi, 1999; Hong, 1998; Hyun & Lent, 1999; Jin, 2006; Jung, 1997; Kim 2003; Koh, 2001; Yoon, 1999), but we argue that many of the anomalies identified above may be explained in relation to the changing motivations and consequent behavior of one of the principal actors in the Korean telecommunications industry, namely Korea Telecom. We will argue that the evolution of universal service policies in Korea took a distinctive path because of critical decisions taken by Korea Telecom and the government in the pre-reform period. We further argue that Korea Telecom continued to be the main vehicle for the implementation of the government's universal service policies while competition was being introduced in stages, between 1991 and 1998. The situation began to change only with the privatization of Korea Telecom in 2002. Accordingly, our case study covers the period from 1987 to 2002. The next two sections discuss respectively the monopoly period, and the introduction of competition in Korea beginning in the early 1990s. The evolution of universal service policies is then taken up, and the conclusions thereafter.

As a case study on the “temporal sequencing” of events (Mahoney, 2000, p. 509) within a limited time-frame, our objective in this paper is limited to analyzing the dynamics of competition and universal service during the 15-year span from 1987 to 2002. Less attention is given to consequential events such as the privatization of Korea Telecom and the intense competition that was to develop in broadband in the 21st century, because our main concern is with examining the dynamics of universal service in a system with a dominant state-controlled telecommunications provider.

Network expansion during the monopoly period

As stated in the introduction, the consensus in theory and the case study literature is that state-owned monopolies in developing countries are not able to achieve rapid network deployment due to resource constraints and managerial inefficiencies. The lack of financial resources is compounded by the well-intentioned but counter-productive effort of many states to make telephone subscriptions affordable through artificially low rates. As a result, the telecommunications company is not able to mobilize the resources to deploy the network, even as demand skyrockets: long waiting lists are the result. Demand management becomes an administrative exercise, through rationing of telephone connections with all the attendant potential for corruption and abuse.

Korea in the state-monopoly period managed to avoid this dilemma by adopting a distinctive approach to network deployment. The country achieved increases in teledensity as well as regionally balanced network expansion before liberalization was introduced. This was done through two interrelated policy choices: first, two programs of network growth, the Immediate Telephone Installation System (ITIS) and the Widening and Automation (WA) program, were implemented; and second, the state mobilized domestic capital through higher subscription rates and the issue of telephone bonds. These two choices are discussed in greater detail in the sections below.

Network expansion programs

In most countries, telecommunications policies at the early stage of the network growth tended to target teledensity rather than regionally balanced network expansion (Gordon & Haring, 1984). Unlike other countries, however, Korea introduced two ambitious network expansion programs, the Immediate Telephone Installation System (IT

IS) and the Widening and Automation (WA) program, during the state-owned monopoly period, which didn't aim at merely teledensity increases but pursued regionally balanced network expansion as well. These two policies, particularly the WA, were designed to address the problem of the gap between urban and rural areas which emerged as a political and social issue starting in the late 1970s (Kim & Lee, 1991).

As explained well in previous works (Kim, 2003; Kim & Lee, 1991; Koh, 2001; Korea Telecom, 2001; MOC, 1988), the ITIS was designed to expand transmission networks and to provide high-capacity switching equipment and largely contributed to teledensity growth. The WA simultaneously pursued two separate telecommunications policies, widening of local zones and subscription zones¹ and automation of switching. The WA greatly contributed to the growth of telephone subscriptions in rural areas and played a major role in achieving regionally balanced network expansion by lowering the cost of usage and access for rural telephone subscribers and improving service to rural areas. Specifically, the WA widened local call zones enabling residents in rural areas to call nearby urban areas at cheaper rates than before, because calls that had earlier been classified as long distance were now local. Additionally, the WA gave a higher priority to the automation of switching in rural areas with the result that by 1987 service in some rural areas was fully digitalized with electronic switches, even as some urban areas continued to be served with electromechanical switches. This enabled residents in rural areas to enjoy better quality of telephone service than those in urban areas (Kim, 2003; Kim & Lee, 1991; Korea Telecom, 2001).

As a result of these two telecommunications policies, teledensity growth

¹ Local call zones and subscription zones refer to zones in which the same local call rates and subscription charges were applied, respectively (cited in Kim & Lee, 1991, p. 36).

significantly increased and the total number of telephone subscribers reached 10 million in 1987. This implies that the number of telephone subscriptions increased at the pace of about a million a year from 1981 to 1987. By 1992, the number of telephone subscribers reached 17 million and Korea ranked as the ninth top nation in the world in terms of the number of telephone subscriptions. Further, regionally balanced network expansion, energetically pursued by the Korean government with a slogan of ‘One Household, One Telephone’ in the 1980s, was also successfully achieved. Thus, telephone service was provided to almost all households, even in rural areas, mountainous regions and isolated islands before competition was introduced in the 1990s (Kim, 2003; Kim & Lee, 1991; Koh, 2001; Korea Telecom, 2001; MOC, 1988).

Utilizing domestically raised capital for network investment

Korea adopted strategies for financing network expansion and teledensity growth different from that of other developing countries. In particular, contrary to other developing countries that embraced competition, or allowed foreign investment, or privatized state-owned telecommunications enterprises to raise the huge capital needed for network expansion, Korea achieved network expansion and teledensity growth largely utilizing domestically raised capital in the monopoly era.

First, beginning in 1979, the Korean government started a policy of requiring all new telephone subscribers to buy telephone bonds as a condition for obtaining a connection. These government bonds might be thought of as a substitute for installation fees, with the difference that they paid interest to bondholders and were redeemable on maturation. Second, the government raised local call rates by 66% from 12 won

(approximately 12 cents) to 20 won (approximately 20 cents) in 1981 to help the state-owned monopoly's financial position and to accumulate capital needed for implementing the IT IS and the WA. While rate increases have been controversial in other countries, Korea in the 1960s-70s was growing rapidly and customers were able to afford the steeply raised telephone service rates. Also, the huge pent-up demand for connections made the rate increases more acceptable to consumers. Through these two moves, the Korea Telecom Authority (KTA - as Korea Telecom was formerly called) was able to domestically finance the huge capital requirements for the development of the telecommunications sector. As Table 1 indicates, the KTA's internal financing² for its total investment, including network expansion, increased from 44.9% in 1981 to 75.9% in 1987 due to a series of rate hikes, while funding from foreign investors decreased to 0% from 20.1% during the same period. Once regionally balanced network expansion was successfully achieved by the end of this period, the requirement to buy telephone bonds was withdrawn and rural telephone service rates were re-adjusted in 1988 (Kim, 2003; Kim & Lee, 1991; Koh, 2001; Korea Telecom, 2001; MOC, 1988).

(Table 1 goes here)

Thus, the liberalization of the 1990s was not motivated by unmet demand for domestic service, and network expansion and universal service were not primary goals of telecommunications reform. Instead, competition was introduced primarily under international pressure for investment opportunities.

² This refers to the part of the KTA budget that came from telecommunications revenues.

Introduction of competition in Korean telecommunications

In the late 1980s, the Korean government came under enormous pressure from foreign players including the United States to open its telecommunications sector to competition (Choi, 1999; Hong, 1998; Hyun & Lent, 1999; Jin, 2006; Jung, 1997; Kim 2003; Koh, 2001; Yoon, 1999). In response, Korea began to introduce competition in telecommunications with the first structural adjustment in 1991. The government introduced partial competition to the international call, mobile service, and wireless pager markets and opened the value added service market to full competition. Specifically, DACOM, a second international call carrier, began to compete with Korea Telecom in December, 1991, and ten service providers were newly invited into the wireless pager market in August, 1992. In addition, Shinsegi Tongshin, a second mobile service carrier, began to provide mobile service in July, 1994 in competition with SK Telecom³ (Hong, 1998; Koh, 2001). The emergence of new telecommunications service carriers finally put an end to Korea Telecom's monopoly that had lasted over one hundred years.

In spite of the introduction of competition in these new services, the first structural adjustment stopped far short of introducing full-fledged competition. Foreign players as well as domestic conglomerates continued to push the Korean government to invite more competition after the first structural adjustment because the Korean telecommunications market was very attractive to them. Thus, the government carried out the second structural adjustment in telecommunication in 1994, and opened the long-distance call market to competition. DACOM was licensed as a second long-distance call service provider in March, 1995. Additionally, new telecommunications services, such as

³ SK Telecom originated as Korea Mobile Telecom owned by Korea Telecom; in January 1994, Korea Mobile Telecom was privatized and sold to Sunkyung, one of Korea's big conglomerates, and was renamed SK Telecom

PCS (Personal Communications Service) and TRS (Trunked Radio System), were introduced (Hong, 1998; Koh, 2001).

In 1995, one year after the second structural adjustment, the Korean government announced ‘A Blueprint to Improve Competitiveness of the Telecommunications Industry’ and conducted the third structural adjustment in telecommunications. Like the two previous adjustments, this reform also aimed at improving the competitiveness of domestic carriers against foreign telecommunications service providers, prior to the introduction of full-scale competition to the telecommunications market—a key requirement if the WTO basic telecommunications negotiations were to reach an agreement. In the third structural adjustment based on the Blueprint, the Korean government licensed twenty-seven new service providers in 1996 and introduced competition to all telecommunications markets except the local-call market (Hong, 1998; Kim, 2003; Koh, 2001).

The WTO basic telecommunications negotiations finally reached an agreement in February, 1997. Consequently, the Korean government began the fourth structural adjustment in telecommunications in the same year, which aimed at more competition among domestic carriers as well as deregulation of foreign direct investment (FDI) to telecommunications in the preparation for full liberalization of its telecommunications market. As a result, Hanaro-Tongshin was licensed as a second local call service carrier and local-call market was opened to competition in 1998. By this step, Korea completed the process of the introduction of competition to its telecommunications market (Hong, 1998; Kim, 2003, Koh, 2001).

The key feature of the last two structural adjustments during the period of 1995 ~

1997 was the transition to a fully-competitive market, which had been largely controlled and managed by the government until then, even though the first two structural adjustments had liberalized some sectors selectively. In particular, the third structural adjustment had three major slogans: ‘diffusion of competition’, ‘enhancement of competitiveness of Korea Telecom’ and ‘implementation of competitively neutral market’ (Hwang, 1999; Koh, 2001).

Though pressure from foreign players induced the Korean government to liberalize its telecommunications market, the government managed to retain control over the pace and specifics of reform (Yoon, 1999). For example, despite pressure from the United States and others to fully open its telecommunications market to competition, the government made its own master plan to introduce competition and new services to the telecommunications sector step-by-step. According to many commentators, one of the government’s main objectives seems to have been to protect its telecommunications industry from foreign competitors (Hong, 1998; Kim, 2003; Yoon, 1999). As a result, competition among domestic service providers was gradually introduced in the initial phase of market-oriented reform before foreign competitors were allowed to come in. Even as enough reforms were implemented to defuse pressure from international actors for quick action on liberalization, the Korean government ensured that domestic service providers will have an opportunity to enhance their productivity and competitiveness.

What aided the government’s autonomy in structuring the timetable for the introduction of competition in spite of international pressure? Part of the reason was the absence of significant pressure from consumers for better service—one of the principal reasons why developing countries are impelled toward telecommunications reform.

During the era of a state owned telecommunications enterprise in the 1980s, Korea had managed to expand the telecommunications network while simultaneously promoting universal service—a difficult balance to achieve since the rate controls and cross-subsidies often used for universal service inhibit network investment. This was the result of a unique partnership between the state and Korea Telecom, but the net effect was that Korea had achieved significant teledensity growth and balanced regional development even before competition was introduced. As a result, pressure from consumers was not a significant factor behind the decision to introduce telecommunications reforms.

Universal Service in Korea

The high degree of network development achieved during the monopoly period resulted in a unique evolutionary path for universal service in Korea. For one, the introduction of competition in Korea didn't spark demands for universal service programs, nor was competition advocated as a means of furthering universal service. Indeed, the discourse around the introduction of competition had very little to say on universal service, either in a positive way that competition will aid universal service or negatively that social objectives like universal service will be sacrificed in a competitive market. As a result, it took eight years after competition was invited to the Korean telecommunications market for the term “universal service” to appear in official documents—in the Telecommunication Business Act (TBA) revised in September, 1998. In other words, universal service emerged in the policy discourse only after the phased introduction of competition was mostly completed, and not during the eight-year period when competition was gradually introduced. This section traces the evolution of the

universal service concept in Korean telecommunications policy during the monopoly period and beyond. Additionally, we discuss why the introduction of competition had less impact on universal service in Korea, compared to the case of other countries.

Few telecommunications laws in Korea had provisions related to universal service prior to the late-1990s; and where such references existed, they were in the nature of general statements of intent, not requiring specific policies or programs. The earliest telecommunications law to mention universal service was the KTA Act in 1981, which stated that “the KTA should contribute to promotion of the public interest such as the interests of people and social welfare through reasonable and responsible operation.” and that “the KTA should strive to provide all the people with telecommunications service in equitable and convenient ways.” The 1991 revision of the TBA had a more specific reference to universal service: Article 3 stated that “telecommunications service providers must not refuse to provide telecommunications service without fair and legitimate reasons.” In addition, Article 29 of the same act indicated that “telecommunications service should be provided at reasonable rates, in order not only to promote the development of the telecommunications sector, but also to provide residents with a variety of telecommunications services conveniently and fairly at cheap prices.”

With no other guideline passed with the introduction of competition, the status quo ante prevailed and the state-owned telecommunications enterprise was still obliged to provide all people with telecommunications. Cross-subsidies within the state-owned telecommunications sector continued as before. Kim (2003) points out that “(the laws) didn’t reflect changes in market structure caused by the introduction of competition, nor did they make mention of how to operate the universal service mechanism” (p. 122~123).

This situation continued until the TBA was revised and the Ministerial Ordinance of the Ministry of Information and Communications (MIC) was enacted in 1998.

Though there was no statutory framework for universal service until the late 1990s, Korea did have an informal universal service system in place. The distinguishing characteristics of this system were a partnership between the government and Korea Telecom, and the expectation that the latter would continue to be asymmetrically burdened in carrying out the policies and programs of the government. First of all, in spite of the emergence of new telecommunications providers, Korea Telecom was designated as the sole universal service provider in local phone service, local public phone service, isolated area communication service, and wireless phone service for ships. This is because the other telecommunications service providers argued successfully that companies other than Korea Telecom will not be able to provide these services nationally. Only in some limited categories of service did the new carriers such as SK Telecom, Hanaro Telecom, and DACOM share the burden with Korea Telecom: for emergency phone service, exempted and reduced fee services for low income citizens and the handicapped (Jeong, 2004; Kim, 2003; Korea Telecom, 2001).

The asymmetric burden placed on Korea Telecom changed little even after the transition to competition was completed by 1998. As stated previously, the Ministerial Ordinance that year revised the Telecommunications Business Act (TBA) to explicitly define universal service for the first time. In 2000, a new universal service mechanism was introduced pursuant to the Ordinance that extended subsidy support for the services for which Korea Telecom was the sole universal service provider: namely, local phone service, local public phone service, isolated area communication service, and wireless

phone service for ships. But under the computation methods use for universal service fees, Korea Telecom's losses incurred by universal service would not be fully compensated for by the government or other service providers. According to the Ministerial Ordinance, service providers which experience losses from providing universal service may be subsidized by the government or other service providers for the following services: 1) local call service whose ratio of the required cost to revenue is more than 110:100, 2) local public phone service for which the ratio of the required cost to revenue is more than 130:100, 3) isolated area communication service, 4) wireless phone service for ships. In effect, universal service providers are not subsidized for local call service for which the costs exceed revenue by less than 10 percent, or for local public phone service when the excess of costs over revenue is less than 30 percent. Additionally, even in the case of local call service whose ratio of the required cost to revenue is more than 110:100 (and for public phone service where the costs to revenue ratio is more than 130:100), the service provider's losses are equated (for computational purposes) to 90% of its actual losses caused by the service, on the argument that the service provider gets intangible benefits by providing universal service. Further, only 70% of these imputed losses are considered as the amount which may be subsidized. In spite of these several steps of computation, however, the losses incurred by providing local call service to high cost areas are not compensated for if the universal service provider makes profits from its local call service as a whole. For public phone service as well, no compensation is provided if the universal service provider makes profits from its public phone service as a whole (Jeong, 2004).

In the case of isolated area communication service, the Ministerial Ordinance

limits compensation to the losses incurred for installation of wireless transmission devices for providing local call service to isolated areas. Additionally, the amount which may be subsidized is limited to 90% of these losses. For wireless phone service for ships, the universal service provider's losses had been fully compensated until 2003. But since 2004, its losses from providing wireless phone service for ships have been computed by Long-Run Incremental Costs (LRIC) because the government expected this method to prevent the universal service provider from imposing the costs incurred by its inefficiency on other service providers (Jeong, 2004; Kim, 2003).

The negative impact of these computations has fallen entirely on Korea Telecom, the sole universal service provider for the four services mentioned above, preventing it from being fairly subsidized for universal service. As Table 2 indicates, Korea Telecom's actual losses incurred by providing local call service to high cost areas were \$2128.3 million during 2000~2005, but they were equated to \$200.4 million (9.4% of the total losses) in the process of computation. As a result, Korea Telecom was subsidized \$135.2 million (6.4% of the total losses) from other service providers. This represented the net subsidy receipts of Korea Telecom, after Korea Telecom's own share of the total universal service support was subtracted from the total subsidies it was eligible to receive. Additionally, as Table 3 notes, Korea Telecom's actual losses from providing public phone service were \$668.5 million during the same period, but they were equated to \$253.3 million (37.9% of the total losses). And, Korea Telecom was subsidized \$171.8 million (25.7% of the total losses) from other service providers after its own contributions were deducted from the eligible subsidy. In other words, Korea Telecom paid 93.6% of the total losses from providing local call service to high cost areas and paid 74.3 % of the

total losses incurred by public phone service during the period of 2000~2005 (Korea Telecom, 2007).

(Table 2 goes here)

(Table 3 goes here)

Overall, as Table 4 below shows, Korea Telecom's total losses incurred from providing four types of universal service—local call service, public phone service, isolated area communication service, wireless phone service for ships—were \$2991.8 million⁴ during the period of 2000~2005. However, they were equated to \$635.2 million (21.2% of the total losses) after computation. As a result, Korea Telecom was subsidized \$428.6 million (14.3% of the total losses) from other service providers after the levy imposed on Korea Telecom was subtracted from the computed losses of \$635.2 million. This implies that Korea Telecom paid 85.7% of the total losses incurred by providing four types of universal service during the period of 2000~2005 (Korea Telecom, 2007). As a result, Korea Telecom's losses incurred by universal service have not been fairly and symmetrically compensated even after full-scale competition was introduced.

(Table 4 goes here)

As discussed so far, the universal service mechanism initiated after the introduction of full-scale competition mainly focuses on the computation of compensation for the losses from providing four different categories of service.

⁴ This is the sum of the total from Table 3 (\$2128.3 million) plus the total from Table 4 (\$668.5 million) plus losses for isolated area communication service, and wireless phone service for ships.

Paradoxically, the lacunae in the then-existing models for universal telephone service did not prevent the Korean government from extending universal service programs to new technologies such as the Internet. Consequently, the development of a national information infrastructure and universal service for the Internet were also initiated and promoted largely by the government-run telecommunications service provider. The repetition of the same pattern of reliance on the former monopoly carrier to implement government policy indicates that the pattern is a deliberate strategy. The next section discusses the extension of universal access programs to the internet.

Universal access and the Internet

In 1995, the Korean government initiated a master plan labeled the Korean Information Infrastructure (KII) Project to build an information superhighway. Korea Telecom was appointed as the key agency with full responsibility for the project, including a major share of the project cost, as well as for the development of technologies and equipment to build the information superhighway, in partnership with ETRI (Electronics and Telecommunications Research Institute) and KAIST (Korea Advanced Institute of Science & Technology). In terms of financing the project, the government required Korea Telecom to provide initial support of \$23.1 million which was more than 70 percent of the seed capital cost of the project. Under the KII Project, a broadband network based on ATM (Asynchronous Transmission Mode) switches and fiber optic lines was constructed beginning in April, 1996 (Korea Telecom, 2001).

In addition, complying with the government's request, Korea Telecom established a master plan to convert its Public Switched Telephone Network (PSTN) to fiber optic

lines with ATM switches all across the country by 2015. The government announced in 1997 that Korea Telecom would be charged with almost all the expenses of \$4.5 billion for the project aimed at connecting all households and enterprises to a broadband network, despite the fact that Korea Telecom had suffered from stagnant revenues and decreasing profits since competition was introduced (Korea Telecom, 2001). As the first step in constructing an information superhighway all over the country, Korea Telecom constructed a fiber optic telecommunications network with 367 ATM switches in 144 areas and provided all state-owned and public institutions with broadband network service by August, 2000 (Jeong, 2004; Korea Telecom, 2001). Since 2005, Korea has begun to upgrade its circuit-based backbone networks to all Internet Protocol (IP)-based backbone networks in order to integrate wired, wireless, and high-speed Internet backbone networks. The IP-based integrated backbone networks are currently expected to be constructed by the mid-2010s, and will provide 100Mbps wired broadband network service and 10Mbps wireless broadband network service (The Electronic Times, 2009).

In addition to its contributions to the construction of the broadband infrastructure, the obligation of providing Internet to rural areas was also imposed on Korea Telecom because other private telecommunications enterprises were reluctant to provide broadband network service to rural areas which were not lucrative to them. Thus, it was taken for granted that the state-owned service provider will take the responsibility for investing in unprofitable rural areas to provide the Internet for the promotion of the public interest. In these circumstances, Korea Telecom was used as an effective vehicle to implement the government's universal service policies for broadband network service without fair compensation for the losses caused by providing it to rural areas. This

became one of the major factors behind the rapid growth of broadband penetration in Korea.

Despite the fact that there were no universal service mechanisms or funding for broadband network service, Korea was able to implement its universal service policies for the Internet with little worry about funding resources because the government had a major stake in Korea Telecom and compensation for Korea Telecom's losses from providing the Internet to high cost areas was not a big concern, before Korea Telecom was privatized (Jeong, 2004; Korea Telecom, 2007). In effect, the obligations of universal service for the Internet, such as the construction of infrastructure and providing broadband network service to rural areas at affordable rates, were also largely imposed on the state-owned telecommunications service provider even after competition.

In Korea, despite the introduction of competition and the emergence of private telecommunications enterprises, universal service was still initiated and led by the government instead of market forces. In particular, the government utilized the state-owned telecommunications enterprise as an effective and useful vehicle for its policy goals even after full-scale competition was introduced. In this process, the obligations of universal service for the telephone and the Internet were asymmetrically imposed on the state-owned service provider largely because of one of the government's major goals in telecommunications was the enhancement of the new entrants' competitiveness against Korea Telecom. As a result, the introduction of full-scale competition did not terminate Korea Telecom's support for universal service through its internal cross-subsidy.

To summarize, the most important feature of the evolution of universal service in Korea is that competition did not terminate Korea Telecom's status as the main universal

service provider. In contrast to most other countries' cases where the former monopolies accepted asymmetric regulation only under protest, or when they were allowed other attractive inducements – such as the permission to enter long-distance in the United States, Korea Telecom, as a state-owned enterprise, acquiesced in the asymmetric regulation even after the introduction of competition until its ownership change. Before privatization, Korea Telecom was still regarded as the government-run enterprise with a duty to promote social welfare, and it had the financial resources and capabilities to contribute to social objectives, such as universal service. For instance, despite losses from universal service, the average of Korea Telecom's annual net profits was \$672 million during 1995 ~ 2002 (KISDI, 2006; Korea Telecom, 2006), which enabled Korea Telecom to provide financial support for implementing the government's agenda in telecommunications, such as universal service. But once Korea Telecom was privatized, this system proved to be no longer sustainable.

Conclusions

This case study of Korea contradicts the expectations from literature that network expansion cannot be achieved under the state-owned monopoly, and that the introduction of competition results in calls for universal service. Thus, we may need to reconsider the popular conception that a state-owned monopoly in a developing country is inherently unable to implement teledensity growth and universal service. The Korean case indicates that teledensity growth as well as regionally balanced network expansion could be successfully achieved under a state-owned monopoly. The inability of state-owned monopolies to effect network growth may instead be the result of a deliberate political

choice to keep rates low, in implicit recognition of the state-owned enterprise's role as a public service provider: consequently, state-owned monopolies in developing countries are perpetually starved of funds, and the low subscription prices contribute to high demand and long waiting lists. Korea avoided these twin problems by letting rates re-adjust during the monopoly period itself.

From this perspective, market-oriented reform is not the sole solution for developing countries to pursue the development of their telecommunications sector. However, it should also be pointed out that Korea's case is exceptional in the sense that the high economic growth rates during the 1960s and 1970s increased household incomes and made the subscription-rate readjustments more palatable, enabling Korea Telecom to raise capital domestically. Other developing countries not so fortunately placed may still face constraints in raising capital internally, and may have no recourse but privatization or international investment. In this regard, some may argue that the most effective universal service policy is to increase overall economic growth—but that is often 'exogenous' to telecommunications policy debates.

Secondly, the Korean case implies that a state-owned telecommunications enterprise can successfully advance a government's policy priorities such as universal service, even after the introduction of competition if its operating performance is good enough to contribute financial resources to social objectives. After competition was introduced to telecommunications, Korea was able to achieve the rapid development of the broadband network infrastructure and secure universal service for high speed Internet and telephone, utilizing Korea Telecom's large net profits.

Thirdly, the Korean case demonstrates that the universal service policies are most

effective when they rely on a combination of public support for network deployment, reasonable rates and pro-active government policy. Programs such as the IT IS and the WA for telephone service and the KII Project for the Internet have played a major role in promoting the rapid development of network infrastructure. Korea also did not depend on affordability as the primary driver of penetration increases: by allowing rates to increase to reasonable levels and permitting installation costs to be collected through telephone bonds, Korea ensured viable long-term network growth. Pro-active universal service policies enabled Korea to provide broadband infrastructure to 99 percent of all Korean households by 2007, including those in rural and isolated areas (Korea Telecom, 2007). As Frieden (2005) points out, Korea might not have been able to implement the regionally balanced broadband networks in such a short period, without the universal service policies led by the government because the private sector, without compensation or incentive, tends to avoid constructing the network infrastructure in rural areas which are unattractive markets.

The events we have described in this paper prefigure later developments such as the privatization of Korea Telecom and the rise of intense competition in broadband that was to develop in the 21st century. It may be argued that, in the interest of completeness, these events should have been included within the scope of this case study. However, broadening the historical canvas would have necessarily implied a dilution of our focus on critical management and policy choices made by KT and the government in the pre-privatization period while lengthening the present work beyond the scope of a journal article. We have however dealt with these events in greater detail elsewhere (Kim, 2009), and intend to return to it in future work.

Ultimately, every case study is unique, and so is this one. Korea's experiences may not be directly replicable in any other developing country. If Korea's high economic growth rates made domestic capital formation a viable option, the particular governance arrangements in that country, specifically the government-corporate partnership, enabled unique modes of program implementation. In spite of this limitation, this study may provide policy-makers and scholars in telecommunications with alternative pathways to achieving similar policy goals. The available options on the policy menu for developing countries might be competition or privatization. But other recipes too might be possible, for developing countries depending on their tastes, as the Korean case demonstrates.

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Table 1: Funding for the KTA's investment during 1981~1987

(Unit: %)

Year		1981	1982	1983	1984	1985	1986	1987
Internal financing		44.9	44.1	54.7	66.1	72.1	73.4	75.9
External financing	Foreign investment	20.1	23.0	15.8	7.9	3.7	1.2	-
	Telephone bonds	15.8	11.0	12.9	11.4	11.9	12.7	11.2
	Installation fees	19.2	13.4	16.6	14.3	12.1	12.5	12.1

(Source: MOC, 1998)

Table 2: Losses incurred by providing local call service to high cost areas

Year	Losses (A)	Levy imposed on service providers (B)		Losses not compensated for (A-B)
		Korea Telecom	Other service providers	
2000	479.4	0	0	479.4
2001	363.2	0	0	363.2
2002	349.2	51.5	105.6	192.1
2003	451.2	13.7	29.6	407.9
2004	274.8	0	0	274.8
2005	210.5	0	0	210.5
Total	2128.3	65.2	135.2	1927.9

(Source: Korea Telecom, 2007)

(Unit: million dollars)

Table 3: Losses incurred by public phone service

Year	Losses (A)	Levy imposed on service providers (B)		Losses not compensated for (A-B)
		Korea Telecom	Other service providers	
2000	201.5	14.7	25.6	161.5
2001	146.2	12.5	24.0	109.7
2002	85.9	9.9	20.2	55.8
2003	81.0	16.1	34.9	30.0
2004	73.4	13.6	31.1	28.7
2005	80.5	14.6	36.1	29.8
Total	668.5	81.5	171.8	415.1

(Source: Korea Telecom, 2007)

(Unit: million dollars)

Table 4: Losses incurred by universal service

(Unit: million dollars)

Year	Losses (A)	Levy imposed on service providers (B)		Losses not compensated for (A-B)
		Korea Telecom	Other service providers	
2000	728.2	29.0	50.3	648.9
2001	551.5	26.1	50.3	475.1
2002	469.2	72.0	147.4	249.8
2003	560.5	38.2	82.7	439.6
2004	368.4	20.3	46.2	301.9
2005	314.0	21.0	51.7	241.3
Total	2991.8	206.6	428.6	2356.6

(Source: Korea Telecom, 2007)