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Provision of universal service and access over IP networks in Japan

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ABSTRACT

Universal service is governed by a regulatory framework that guarantees nationwide access to basic telephone service over the public switched telephone network (PSTN). The ongoing network migration to IP networks, however, poses the question of how the existing framework would accommodate this change.

Taking the case of Japan, this paper presents an overview of Japan's universal service system under the network migration and argues the importance of assessing consumer preference for universal service in adapting the system to this new environment. After describing the existing system including the universal service fund and the impacts of the transition to IP networks, the government's responses to cope with the change are reviewed. A system of universal access is proposed which is designed to ensure access rather than a specific service. To realize a new regulatory framework for universal access, studies will be necessary on issues such as the scope of universal access and ensuring sufficient compensation. Emphasizing the importance to evaluate consumer preference or willingness-to-pay for universal access, an empirical analysis in an experimental framework is conducted, which examines whether consumers are willing to accept the additional burden of sustaining universal access if they are well informed about the issue. Finally, challenges for future studies on universal access are referred.

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1. Introduction

Ensuring the provision of universal service is an important policy issue in the telecommunications field. In many countries, the governments have long made efforts to ensure that their citizens, including those living in high-cost and low-demand areas, can have access to basic telephone service at any time and any place as well as at an affordable price. As the market has turned into an environment where multiple carriers provide telecommunications services usually in a competitive way, the governments have set up a universal service fund (USF) to adjust the cost burden among those carriers by subsidizing revenues from profitable urban and high-demand areas to less profitable rural and low-demand areas.

Today, however, the telecommunications industry is in a transitory stage where PSTN and other existing networks are being taken over by Internet Protocol (IP)-based networks. IP networks such as broadband access are spreading mainly from urban areas and replacing the PSTN. Yet such spread is slow in rural areas and a large part of PSTN remains in place. Due to the difference of profitability between urban and rural areas, it is hard to sustain the existing USF system based upon the basic telephone service over the PSTN.

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The challenge for USF is how to accommodate the current system in this network migration. Unlike the PSTN, IP networks provide access rather than a specific service. With IP networks, users are able to enjoy not only a simple telephony service but also other services available through the networks. This means that the system of universal service that aims at ensuring the provision of a basic telephone service should be replaced by universal access based on IP networks. One issue to be considered is, taking the cost into account, what kind of access the system should ensure for the people across the country.

At the same time, sufficient contributions to the fund would be necessary if it is to ensure universal access or services provided by the IP networks. With compensation from the fund, carriers that offer their access or services through non-PSTN networks would be given an opportunity to expand their customer bases. But without adequate compensation to cover the associated deficit, they would have little incentive to supply the new services. Thus, the current USF system should be reorganized to compensate such potential carriers so that they can launch business activities even in high-cost and low-demand areas.

To address these challenges, it is helpful to understand consumer preference in terms of how much they would be willing to pay additionally for universal service, or willingness-to-pay (WTP), because it is consumers who finally bear the cost of provision of universal service or access.

This paper aims to discuss the change in the regulatory system of universal service in response to the network migration and proposes an approach to measuring consumer preference in order to address the challenges, by taking up the case of Japan. The country serves as a good example, as it is poised to terminate the PSTN and launch IP-based services while its government is promoting the diffusion of broadband networks with the goal of covering all households there by 2010; facing the need to reform the existing USF system in response to the transition to IP networks, the Ministry of Internal Affairs and Communications (MIC) proposed a regulatory change towards universal access.

This paper is organized as follows. An overview of Japan's current regulatory framework for the USF is given in the next section. The impact of the increased dominance of IP-based services over PSTN on the maintenance of universal service is discussed in Section 3. Then, citing a government proposal, Section 4 explains the necessity of a new framework for universal access to adjust to the coming new environment of "Everything over IP" networks. Section 5 points to the significance of evaluating consumers' preference for universal access. In Section 6, an empirical estimation is conducted on how much consumers would be willing to pay for universal access using the data collected through a questionnaire survey. The final section presents the conclusions and refers to challenges for future studies on universal access.

2. Existing framework of universal services in Japan

2.1. Overview

Similar to the situation in many other countries, universal service in Japan is denoted as a basic telephone service, the provision of which is legally guaranteed. The Telecommunications Business Law, which regulates the telecommunications industry in Japan, defines basic telecommunications service as what is indispensable for people's daily lives so that its provision must be ensured. This basic service must meet three key requirements: (1) essentiality (essential to the life of every person); (2) affordability (affordable for everyone); and (3) availability (available everywhere without regional gaps), and thus full coverage for the total population is guaranteed (MIC, 2006a).

Under the law, MIC designates the following services over the PSTN as the basic telecommunications service: (a) subscriber telephone line access, including telephone call service for remote islands using analog fixed phones; (b) public pay phones classified in a category where installation is required to ensure a minimum of outdoor communications; and (c) free emergency calls to the police, fire department and coast guard. Local call service used to be part of the basic service, but was excluded from the list in 2006.

It should be noted that the universal service scheme in Japan is designed to narrow geographical gaps by guaranteeing access to basic telephone service in high-cost areas such as mountainous regions and remote islands. It does not include access provided for low-income families or minorities, which is regarded as part of social welfare policies. Also, recently emerged services such as mobile phones and IP-based services such as Voice over IP (VoIP) are not included in the category of universal service.

Universal service in Japan has long been provided by Nippon Telegraph and Telephone (NTT) or its subsidiary local communications companies (NTT East and NTT West). Until 2002, the provision of universal service was a legal obligation imposed on NTT, which allowed cross-subsidization among users so that the financial deficit from providing basic telephone service in high-cost areas was covered by the surplus from that in low-cost areas. As competition became increasingly fierce in the local phone markets, especially in lucrative urban areas, NTT lost a significant percentage of revenue from its telephone business. In the meantime, the company had to continue providing service in unprofitable rural areas. Actually, the deficit had been increasing with regard to basic telecommunications service and it became even more difficult to bear the costs in high-cost areas. To maintain the provision of universal service in such a competitive environment, Parliament passed the revised Telecommunications Business Law in 2002 to introduce the USF system of sharing the cost among concerned telecommunications operators. Under the revised law, eligible telecommunications carriers designated by MIC to provide universal service in a proper, fair and stable manner, are entitled to receive

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