

A Study on the Tariff Index of Mobile Telephony in Korea

KIM, JIN KI

(kimjk@sunset.kisdi.re.kr)

Korea Information Society Development Institute (KISDI)
Department of Telecommunications and Broadcasting Policy

Since the opening of the mobile telecommunications market to new entrants in 1996, the mobile telecommunications industry in Korea has transformed into a severely competitive market. Although there are numerous methods to evaluate the effects of the competition policy, the most relevant would be to measure the decreased degree of mobile service tariff. Also, after the introduction of competition in the market, most carriers launched a variety of new tariff plans, which would satisfy the users' traffic volume and pattern. Therefore, it is necessary to develop a "mobile tariff index" that would collectively consider all the various tariff plans.

This paper aims to develop a mobile tariff index that would accommodate all the various tariff plans provided by mobile carriers. To develop this mobile tariff index, mobile users will first be classified by their traffic volume, and then calculate the average tariffs per minute of each group of users, and lastly weight-average those tariffs per minute. And finally, this paper shows the mobile tariff index by considering those averaged tariffs and the carriers' market shares to reflect the contribution of individual carriers and the users' traffic volume.

1. Introduction

Since the launching of the mobile phone service in 1984 in Korea, the number of users has rapidly increased to record 1 million by 1994. By 1998 the number of users exceeded the 10 million mark, and as of late 1999, it reached 23.44 million. The average growth rate of mobile phone subscribers amounted to

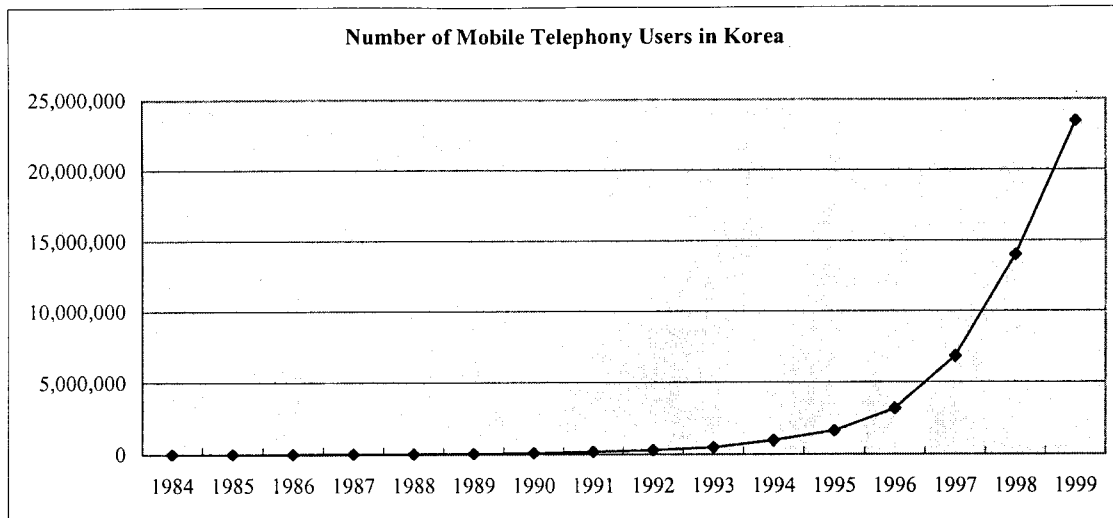
83.24% from 1984 to 1999.

It is speculated that the entry of new carriers in 1996 and the entry of PCS carriers in late 1997 have indeed contributed to the rapid increase of mobile subscribers. However, there still lacks the efforts or the adequate methodology to measure the effects of competition in the market.

<Table 1> Number of Mobile Phone Users

(Unit: person)

Year	1984	1985	1986	1987	1988	1989	1990	1991
Number of Users	2,658	4,685	7,093	10,265	20,353	39,718	80,005	166,198
Year	1992	1993	1994	1995	1996	1997	1998	1999
Number of Users	271,868	471,784	960,258	1,641,293	3,180,989	6,828,169	13,982,919	23,442,724



The most effective way to measure the effects of competition would be through the decrease of mobile phone service charges.

However, this method is inadequate in the sense that simply measuring the decrease of service charges of cellular operators or comparing the service charges between cellular phones and PCS would not suffice to evaluate the real cost of mobile phone charges that users have to burden.

First, since mobile phone charges are divided into monthly charges and call tariffs, the average call charge would change. Therefore, monthly charges and call tariffs should both be taken into consideration.

Second, since carriers are providing various tariff plans to the users, depending on what tariff plan the subscriber is using, the average call charge will differ accordingly. Therefore, in order to determine the charge difference of each carrier, the tariff plans provided by each carrier should be considered.

Third, in order to understand the changes in the overall charges of the mobile phone service, the difference of charges of each carrier should be reflected.

Therefore, to address these disadvantages there is

a need to develop a mobile telephony tariff index.

Realizing such necessity, this paper aims to present a tariff index for mobile telephony in Korea.

2. Literature Review

In general, the most frequently used method to draw up a telephone tariff index is by first identifying the call pattern of the general user group, and then getting the call charge per minute of these user by dividing the call amount into the monthly charge expenditure.¹⁾

In the case of wired telephony, since there is only one tariff plan, one caller can be used as an exemplary to determine the whole consumer group. However, in the case of mobile telephony, since a tariff plan of a caller would differ according to the call amount of each individual, an exemplary caller's call charge per minute will not be able to accommodate all tariff plans.

Therefore, in order to draw up a tariff index for

¹ When comparing tariffs of individual countries, the OECD countries also based their data on the average call amount of users when developing a tariff index that has been drawn up by adding the monthly charge,

mobile telephony, the most frequently used method is by first dividing the subscribers into several groups according to the call amount or minute of use (MOU), and then determining the monthly MOU and call charge expenditure of each group to calculate the call charge per minute of each relevant group, and lastly, obtaining the multiple call charge per minute after making an average by weight of the previous result.²⁾

3. Model and Procedure

The tariff index presented in this paper is calculated according to the following four stages.

Stage 1: Division of subscribers into six MOU groups. 50 min, 100 min, 150 min, 200 min, 300 min, 400 min are the criteria for the MOU division.³⁾

Stage 2: Selection of the most optimal tariff plan according to each MOU group. Selecting a tariff plan that minimizes charge expenditures according to each MOU group, and then assuming that the relevant MOU group users would subscribe this tariff plan.

For example, in the case of SK Telecom, it has set the optimal package plan as follows: 50 MOU and 100 MOU as Save tariff plan, 150 MOU and 200 MOU as flat rate plan, and 300 MOU and 400 MOU as premium plan.

Stage 3: Calculation of per minute call charges according to each MOU group. Then calculating the average monthly charge expenditure of each MOU

group according to each carrier.

- Call expenditure = Monthly charge + (MOU× 10 call charge per second× 6)

When calculating call charges, MOU has been divided according to flat/discount/night rates.⁴⁾

- Call charge per minute = charge expenditure/MOU

Among the total number of mobile phones, the call charge per minute of each MOU group has been calculated. Also, the MOU call charge per minute of each carrier has been made an average by weight. For the average weight, the number of subscribers for each point of time has been used.

Stage 4: Calculation of charges based on the total number of mobile phones. In other words, the call charge per minute of each MOU group has been made an average by weight, and the call amount of charge plan has been used for the average weight.

When calculating average weight, the call amount of a tariff plan which has not been selected as the most optimal MOU group will be included in the most similar call amount tariff plan.⁵⁾

For example, in the case of SK Telecom, although it has family and family save tariff plan, these are not selected as the most optimal tariff plans. Therefore, the relevant call amount has been calculated assuming that the mobile users have subscribed the most similar tariff plan available. (Family → general tariff plan, family save → save tariff plan)

subscriber fee, and call charge expenditure

²⁾ In the US, BPPM(Bundled Price Per Minute) of the Yankee Group is the most frequently used tariff index. This index is drawn up by determining the call charge per minute of subscribers that have an average call time of 60, 100, 250, 500, 1,000 minutes. Then the result is made an average by weight to finally calculate the call charger per minute of the total mobile phone

³⁾ The average MOU in Korea is approximately 150 minutes

⁴⁾ The data compiled from February 1st through 7th 1999 has been used for the call amount

⁵⁾ The call amount data compiled from February 1st through 7th1999 has been used for determining the call amount

4. Result

<Table 2> indicates the average charge per minute of each MOU group. According to this Table, mobile users have to pay 420 won per minute for 50 minutes, 288 won for 100 minutes, 236 won for 150 minutes, 206 won for 200 minutes, 167 won for 300 minutes, and 142 won for 400 minutes as of August 1999. The average charge per minute for mobile telephony amounts to 239 won in Korea.

Meanwhile, when examining the changes in the mobile phone charges for the past three years, the total charge has dropped 26.8%, while SK Telecom dropped 21.1%, due to the low mobile phone charges of new entrants.

The changes for charges per minute for each MOU group is as follows. The lowest decrease rate in charges have been observed for 150-200 minute users since new tariff plans for light and heavy users have been introduced in the market while the standard

charge has not dropped particularly after the introduction of competition in the market.

Reference

Cho, Shin, and Young-Jin Ko, "Korean Tariff Structure Analysis by comparison among countries," *Telecommunications Policy Issue*, Vol.7, No.1, #62, Korea Information Society Development Institute (KISDI), January 1995.

Kim, Hyung-Chan, Jin-Ki Kim, and Dong-Pyo Hong, "Analysis for the Effect of Mobile Competition," *Information and Telecommunications Policy Issue*, Korea Information Society Development Institute (KISDI), 2000. (unpublished)

Sung, Lack-Il, and In-Ho Jung, "Development and Trends Analysis of the Tariff Index of Korea Telecom," *Telecommunications Policy Issue*, Vol.8, No.7, #77, Korea Information Society Development Institute (KISDI), November 1996.

<Table 2> Tariff Index of Mobile in Korea

	96-01	96-02	96-12	97-09	97-10	98-02	98-09	98-10	98-11	99-02	99-06
50 min	100.0	82.9	83.2	61.8	59.4	60.7	61.4	62.8	64.0	63.7	64.1
100 min	100.0	91.2	88.6	75.6	72.6	73.3	71.7	71.5	71.4	71.2	71.3
150 min	100.0	98.8	91.7	81.4	78.2	78.2	75.9	75.6	75.4	75.2	75.1
200 min	100.0	104.5	93.9	83.9	80.6	80.4	77.9	77.7	77.5	76.9	76.5
300 min	100.0	109.3	91.6	80.8	77.6	78.0	75.9	75.7	75.5	74.6	74.5
400 min	100.0	112.4	80.0	74.7	71.7	72.8	71.6	71.5	70.5	70.2	70.3
Total	100.0	97.5	90.3	78.4	75.3	75.3	73.8	73.4	73.4	73.3	73.2

Notes: 1) To identify changes of the tariff index, January 1996 has been set at 100

2) No particular change after June 1999