

# **TELECOMMUNICATIONS SERVICES IN JAPAN'S 2000 BASE CORPORATE SERVICE PRICE INDEX**

Kiyohito Utsunomiya\*  
Kuniko Moriya\*\*

Research and Statistics Department  
Bank of Japan

**19<sup>th</sup> Voorburg Group Meeting –Ottawa, Canada  
27 September - 1 October 2004**

\* Email: [kiyohito.utsunomiya@boj.or.jp](mailto:kiyohito.utsunomiya@boj.or.jp)

\*\* Email: [kuniko.moriya@boj.or.jp](mailto:kuniko.moriya@boj.or.jp)

## 1 Introduction

Technological innovations have brought about a wide variety of services and discount packages in the field of telecommunications services. Conventional services, in contrast, have been abolished or integrated. For example, the popularization of internet protocol telephone services will largely eliminate the distinction between domestic and international services. To reflect these developments, the coverage of items in the revision of Japan's Corporate Service Price Index (hereafter the CSPI) from 1995 to 2000 base has been expanded: items in the revised edition have been rearranged, and the variety of sample prices has increased. This paper describes the current treatment of telecommunications services in the CSPI.

## 2 Definition of Items

In the 2000 base CSPI, telecommunications services are classified within the group "Communications services," which in turn has four subgroups: "Postal services," "Fixed telecommunications services," "Mobile telecommunications services," and "Access charges." The three items in the 1995 base CSPI—"Domestic fixed telephone services," "International fixed telephone services," and "ISDN (Integrated Services Digital Network)"—are integrated into one item: "Fixed telephone services." In the same way, we combined "Domestic leased circuits" and "International leased circuits" in the 1995 base CSPI into "Leased circuits." This new structure offers certain advantages to cope with the modification of service contents flexibly. <sup>1</sup>

The subgroup "Fixed telecommunications services" consists of three items: "Fixed telephone services," "Leased circuits," and "Fixed data transmission services." "Fixed telephone services" include voice transmission services from a fixed place of transmission to its destination by using analog lines and Integrated Services Digital Network (ISDN), which can transmit various types of transmission, such as voice and data, on the line-dominating switching system, and data transmission on the packet switching system. "Leased circuits" are the services that provide private transmission lines, which are available only for contracted customers. There are both analog and digital leased circuits. "Fixed data transmission services" are defined as network services that are settled by various types of transmission methods, including the internet and wide-area ethernet.

---

<sup>1</sup> "Pager services" in the 1995-base CSPI was abolished because of the decrease in transaction value by demand shift to cell phones. See Table 1.

On the other hand, the subgroup “Mobile telecommunications services” consists of two items: “Cellular phone services,” and “PHS (personal handyphone system) services.” “Cellular phone services” provide voice transmission services and data transmission services for mobile users. “Personal Handyphone System (PHS) services” also provide voice transmission services and data transmission services for mobile users, but the PHS services differ from cellular phone services in the sense that PHS uses a radio telecommunications system, which is called the “Personal handyphone system.”

One issue on the item definition of telecommunications is the classification of calls between different services, such as calls from fixed telephones to cellular phones. In this regard, the 2000 base CSPI classifies telecommunications services into the items of the services that the entities having the right to set charges can provide.

“Access charges” are the charges to connect to a telecommunications network supplied by the major domestic telecommunications companies to other telecommunications companies that have the intention to supplement their networks to adjust to customer needs.

### **3 Revision of the Coverage of Sample Prices**

For the purpose of reflecting newly developed services in telecommunications fields, the coverage of sample prices in the 2000 base CSPI has been broadened from the 1995 base<sup>2</sup>. The principle of sampling in the CSPI is to collect prices of representative services that amount to large sales. However, considering the rapid changes in services, we have adopted some new services that will be representative in the near future as sample prices.

Specifically, we add internet protocol telephone services to our sample prices of “Fixed telecommunications services” in the 2000 base CSPI. It is widely acknowledged that internet protocol telephone services will soon be widespread. In “Leased circuits,” we introduced ultra-high-speed (e.g., 600Mbps) digital transmission services and leased circuits using Asynchronous Transfer Mode (ATM). For “Data transmission services,” we increased the number of sample prices for Asymmetric Digital Subscriber Line (ADSL), which has blossomed in recent years.

Sample prices are basically obtained from representative corporate services from a variety of menus. However, we often face the problem of not being able to specify corporate services because some menus are purchased by both corporations and households. In such a case,

---

<sup>2</sup> See table 2.

regardless of purchasers, we select the services whose share in total transaction is the largest.

**4 Method of Price Compilation**

The method of price compilation in the 2000 base CSPI is almost the same as that of the 1995 base CSPI. In compiling an index for each item, actual transaction prices or model prices reflecting both average revision rate of price table and discount rate are surveyed. By this method, we can trace the main transaction prices of telecommunications services.

An explanation of the surveyed prices of fixed telephone services is needed. In Japan, the charge system of fixed telephone services is two-fold: the base fee, and per-call charges. For the base fee, monthly charges are surveyed. The base fee is the charge for the right to use fixed telephone services with certain registered numbers for a month. Discounts are included in the price data if they are considered as representative (most popularly transacted) of price movement. For the per-call charges, regular prices of specific areas and time zones are surveyed. Discounts are also included if they are considered as representative price movements of the services. In reflecting discounts to the indexes, “on a real-time basis” and “on a retroactive basis” have been adopted.

Example: Under the assumption that calls are made during the weekday, and that a long-term contract discount of 1-2 years is in place, typical per-call charges provided by a company are the following:

- Regular price for a per-call charge:
  - 10 yen per 3 minutes during weekdays (A)
- Discount rate for long-term contract
  - (contracts of 1-2 years) : 5% (B)
- Price data for the CSPI :  $9.5 \text{ yen} = 10 \text{ yen} * (100\% - 5\%)$  (C)

The actual process of compiling data is to survey the regular price for service (A) and the accompanying representative discount rate (B), then multiply (A) by (100% - B), and obtain

(C). This calculation is, by and large, applied to other services such as ISDN, international fixed telephone services, leased circuits, fixed data transmission services, mobile telephone services, and PHS services.

An alternative method would be the average unit price method. Under this method, however, changes of quality or quantity of per-call charges may be included in the price movements unless we can bundle similar services for the survey of sample price according to the distance, length, time of calls, and the type of receivers of counterparts. Considering that the various kinds of noises are significant enough to distort the quality of data, the average unit price is not adopted as price data in principle. There is an exception in the item “Access charge,” where we use the averaged price within the bounds of ensuring constant quality.

## **5 Data Collection**

In Japan, although major telecommunications corporations like the Nippon Telegraph and Telephone (NTT) and KDDI still dominate the market, foreign companies and other independent companies have rapidly increased their market shares in recent years through mergers and acquisitions. Therefore, we collect price data for the 2000 base CSPI not only from large-scale, major companies but also from newly emerging companies, which were not fully sampled in the 1995 base CSPI.

As for the method of data collection, there are two ways to survey regular prices for the per-call charge. One way involves the charge of a representative service, such as price data. In domestic fixed telephone services, for example, we collected prices for a middle-distance calls on weekdays during the daytime, and long-distance calls on weekdays during the nighttime and on weekends. The other method of data collection is to assemble several charges of diversified menus. The price level in January 2000 is set as 1,000; after that the index changes according to the average revision rate of the price table to the base price level. The latter is adopted where we cannot specify a representative service as appropriate price data.

In collecting discount rates, there are also two ways of data collection. One way is to

specify a rate for a representative service. This is applicable where discount menus are limited. In reality, however, discount menus have been diversified in recent years. This trend makes it difficult for us to take up a specific discount menu. In such a case we use the average discount rate of all the menus.

If we collect discount rates monthly, we can compile the price, reflecting discount rates on a real time basis. However, it is often the case that discount rates are processed by the financial reports, such as the profit and loss (P/L) statement of service providers. Therefore, we revise the price index retroactively every half year after the financial reports are published.

Chart 1 shows the revision of the index of “Domestic fixed telephone services” in the 1995 base CSPI in April 2004.

## **6 Concluding Remarks**

Technological innovation has been developing very rapidly in the field of telecommunications services; many new services continue to be launched. We have rearranged items so that the 2000 base CSPI has the flexibility of coping with the changes in this field. If necessary, we will widen our sample prices included in items like ADSL services, which were introduced in 2002 in the 1995 base CSPI. Even so, it is impossible to survey all new services—which do not belong to any existing items and which will be in wide use in the near future—in the CSPI, unless the CSPI base-year index revision is carried out.

Quality adjustment is still problematic. It is often the case that technological innovation improves the quality of telecommunications. Data transmission speed through mobile phones, for example, has been improving, while the price tables remain unchanged in response to such improvements. At the moment we don't have a good way to adjust such quality improvement.

Table 1 Revision of items in group “Communications Services” in the 2000 base CSPI

The 1995 base CSPI

Subgroup	Item
Postal services	Letters
	Postcards
	Other postal services
Domestic and International telecommunications services	Domestic fixed telephone services
	International fixed telephone services
	ISDN (Integrated Services Digital Network)
	Data transmission services
	Domestic leased circuits
	International leased circuits
Mobile telecommunications services	Cellular phone services
	PHS (Personal Handyphone System) services
	Pager services
Access charges	Access charges

The 2000 base CSPI

Subgroup	Item
Postal services	Letters
	Postcards
	Other postal services
Fixed telecommunications services	Fixed telephone services
	Leased circuits
	Fixed data transmission services
	<del>Pager services</del>
Mobile telecommunications services	Cellular phone services
	PHS (Personal Handyphone System) services
	<del>Pager services</del>
Access charges	Access charges



Table 2 Sampled services in the 2000 base CSPI

Subgroup	Item	Sampled service
Fixed telecommunications services	Fixed telephone services	Domestic fixed telephone services International fixed telephone services Integrated Services Digital Network (ISDN) Internet protocol tele phone services
	Leased circuits	High-speed digital transmission services Ultra-high-speed digital transmission services Domestic leased circuits Domestic leased circuits using Asynchronous Transfer Mode (ATM) International Domestic leased circuits International leased circuits using Asynchronous Transfer Mode (ATM)
	Fixed data transmission services	IP-VPN (Internet protocol Virtual private network) services Wide-area ethernet services Internet access services by Dial-up Asymmetric Digital Subscriber Line (ADSL) FTTH (fiber to the home) CATV (cable television)
Mobile telecommunications services	Cellular phone services	Voice transmission Data transmission
	PHS	Voice transmission Data transmission



Chart 1

The effect of the revision of discount rate in "Domestic fixed telephone services"

