

METHOD OF PRICING AND QUALITY ADJUSTMENT FOR THE  
“RENTAL” AND “LEASING” CATEGORIES OF THE CSPI  
(CORPORATE SERVICE PRICE INDEX) IN JAPAN

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1. Introduction

Since 1991, the Bank of Japan has produced the Corporate Service Price Index (CSPI) for capturing the price movement of services traded among companies; its data have been available since 1985. Two subgroups—“rental” and “leasing”—are typical corporate services whose combined weights are comprise 9.3 percent of the total CSPI in the 2000 base. As shown in Table 1, “rental” contains three items, and “leasing” contains nine. The correspondence between CPC version 1.0 and the ISIC revision 3 are as follows.

(Table 1) Items of Rental and Leasing

Items	CPC ver.1.0	ISIC rev.3
<b>Rental</b>		
Rental of machinery for civil engineering and construction	73122	7122
Computer rental	73124	7123
Motor vehicle rental	73111, 73112	7111
<b>Leasing</b>		
Industrial machinery leasing	73129	7129
Leasing of machinery and equipment for metalworking	73129	7129
Medical equipment leasing	73129	7129
Leasing of machinery and equipment for commercial and other services	73129	7129
Communications equipment leasing	73125	7129
Leasing of machinery for civil engineering and construction	73122	7122
Leasing of computer and related equipment	73124	7123
Office equipment leasing	73123	7123
Transportation equipment leasing	73111,73112	7111

In the CSPI, we in principle collect price data from correspondent companies directly, and ask them to update representative services when necessary. When we encounter sample replacements, we endeavor to employ quality adjustment by collecting data like production cost, even though this presents difficulties. In practice, however, “rental” and “leasing” are special cases in pricing and quality adjustment. This paper explains both our ideas and practices in the following section.

2. Pricing Methods of “Rental” and “Leasing”

We adopt two pricing methods for these subgroups. One is a normal direct use of prices, in which we collect rental/leasing fees directly from correspondent companies by specifying rental goods and contract terms. The other is the so-called percentage fee method. In some rental and leasing services, service providers often set commission rates on their services according to their rented or leased goods and their contract terms. Because commission rates are not prices that service users pay for their services, rates are converted into comparable prices with other *sample prices* in the index (i.e., converted into value terms) by multiplying them by the appropriate price indexes of rented or leased goods (we call those price indexes “inflaters”). The concept of applying the percentage fee method as sample prices is that the CSPI should reflect price developments of corresponding services. That is, the prices of corresponding services do not depend on commission rates only, but on the services provided by the service providers for the clients.

We apply the percentage fee method to some sample prices of “computer rental” and almost all the prices of “leasing.” For applying those service prices as CGPI data, corresponding rented or leased goods are chosen as “inflaters.” Other than rental or leasing services, there are several services in

which the percentage fee method is employed, such as “securities brokerage services,” “underwriting services,” “securities selling services,” “credit guarantee and related services,” and “fire insurance.” Each sample price is calculated by using corresponding “inflatos” such as indexes of the CPI, and those of construction.

### 3. Quality Adjustments for the Price Index of “Rental” and “Leasing”

In “computer rental” sample replacements occur whenever specified rented computers become obsolete as samples. In such cases, when rental fees are directly collected as prices from corresponding companies, we apply our hedonic regression model used in the CGPI to the CSPI as a substitute. This is because we regard the quality change in services of computer rental as equal to the quality change in computer products.

Table 2 shows an example of quality adjustment. Suppose that our sample price was a rental fee of a notebook computer for six months, and that the representative computer changed added main memory capacity, from 384MB to 768MB, and clock frequency, from 1.0GHz to 1.6GHz. Then, using the parameter of the hedonic regression model for CGPI, we obtained the rate of the change corresponding to the quality improvement of the representative notebook computer: 48.7 percent. Since we assumed that qualities of computer rental service were defined by the computer to be rented, the level of the theoretical price corresponding to the quality of the new rental service was 39,702.9 yen (=26,700\*1.487). Consequently, the difference between this theoretical price (39,702.9 yen) and the actual price (38,900 yen) was treated as the price decrease in the CSPI.

(Table 2) Computer Rental -- Unit: Yen

	Old	New	Price change (%)
Current price	26,700	38,900	--
Change in quality (%)	48.7	--	--
Quality adjusted price	39,702.9	--	-2.0

On the other hand, when we collect commission rates from corresponding companies, quality changes in rented computers are conceptually reflected on the “inflator,” influencing the CSPI indirectly. In reality, the index of “computer rental” has been sharply decreasing since 2000 due to the decrease of personal computers or electronic computers and computer equipment in the CGPI, where the hedonic regression method is employed to adjust quality change in sample replacement.

The same effect can be seen through the decrease in prices of computers and related products in the CGPI in “leasing of computer and related equipment.” Also, in other leasing services, as described above, most sample prices take the form of commission rates. Therefore, quality changes in leased goods are supposed to be reflected in the “inflatos.” For example, in the CSPI, “office equipment leasing” has been decreasing because the CGPI “copying machines” subgroup—which is used as an inflator for the CSPI—has decreased, mainly due to quality improvements.

As for “motor vehicle rental,” our sample prices are rental fees per day, or 12 hours, where groups of types of automobiles are specified. Rented automobiles are classified into four groups: normal-size car, small-size car, truck, and van. In addition, each group has two types of contracts: new contract and continuing contract, each of which is defined as a sample price. In this sense, qualities of automobiles are kept constant. If the sampled group or type of rented automobiles changes, we must replace the old sample by the new one, although it is often difficult to adjust for quality changes. On the other hand, when the definition of the sampled group is unchanged, even if individual automobiles have some quality change, we do not regard it as a change in quality. Our idea is that, because automobile rental service is a comprehensive service conditioned by its convenience, as well as a rented automobile itself, even though there are some quality differences among automobiles, quality of rental service specified by a group bundling a certain range of automobiles remains

unchanged.

We once employed quality adjustment for “motor vehicle rental” using the production cost method. Table 3 shows an example that we faced. In this sample, the rental company reported a change in the price from 8,100 yen to 6,750 yen and in the equipment of its rental car. That is, while the price of new rental service decreased by 1,350 yen, a car navigation system was equipped for a rental car. In reply to our enquiry to the cost to equip a car navigation system, they said that it cost an additional 1,000 yen. Therefore, we treated the difference between the new price, 6,750 yen and the adjusted price, 9,100 yen (=8,100+1,000) as the pure price change.

(Table 3) Motor Vehicle Rental

-- Unit: Yen

	Old	New	Price change (%)
Current price	8,100	6,750	--
Change in cost	1,000	--	--
Quality adjusted price	9,100	--	-25.8

#### 4. Concluding Remarks

As shown in Graph 1, “rental” and “leasing” have had a significant downward influence on the CSPI. Since 2001, they have contributed toward a decrease in the total CSPI by around 0.5 ~ 1.0 percent, although the downward contribution has decelerated in recent years. Long term interest rates may have effects on commission rates of leasing, but the recent stability of interest rates has had little impact on commission rates. The main reason of the price decrease in “rental” and “leasing” is the decrease in inflators or rented goods due to quality improvement. In this sense, it is critical for the CSPI to adjust quality improvement in the CGPI. Although some leasing companies often tell us that “leasing” of the CSPI does not correspond to their actual feeling, we should explain our concept of the CSPI and endeavor to produce a price index that is more accurate, and use available information to the greatest extent possible.

Graph 1

### Rental and Leasing



Graph 2

### Rental

