ABSTRACT

A SIMULATION MODEL DETERMINING MARKET- AND THE STANDARD- DRUG PRICES IN JAPANESE MEDICAL INSURANCE SYSTEM

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In the medical insurance system in Japan, the drug price standards are determined by the Ministry of Welfare, according to which medical institutions are paied for the drugs used in their activities. These drug price standards are revised periodically by so called 90%-bulk-line method in which the new standards correspond to 90% points of the cummulative distributions of the market prices.

On the other hand, the drug dealers usually offer their goods to medical institutions at prices lower than the standards. The differences are counted as the incomes of the medical institutions.

This paper presents a mathematical model to describe how these real prices are determined in competition between two drug dealers, assuming that the medical institutions would select the drugs yielding the largest incomes.

More precisely, we assume that the bidding prices are distributed on intervals whose upper bounds are the price standards and the lower bounds are strategically set by the dealers. Assuming also the shapes of the distributions of the bidding prices, the distributions of the market prices of the both competitors are determined mathematically. Other factors, such as the incomes of the dealers, market shares, revised price standards etc., are determined also mathematically from the market price distributions thus obtained. As mentioned above, the dealers can set the lowest prices strategically so far as they are not less than the costs.

180 simulations are worked out on this model for different conditions. They showed, first of all, the overwhelming effects of the difference between the price standard and the cost on the incomes of the competing dealers. Effects of the discount policies are also discussed in game-theoretical sense.