First-degree price discrimination in the framework with income constrained consumers

The purpose of the paper is to reconsider the implications of the first-degree price discrimination strategy in the setup where the consumers of the product are income constrained.

The classical theory tells us that under first-degree price discrimination the monopolist may extract all the consumer surplus if it is allowed charging different prices for every unit of the product sold compared to the situation where each unit of the product is sold at the same price. In this case the social welfare is the maximal possible. In other words, first-degree price discrimination results in a socially optimal outcome, although in this case the allocation of the surplus generated is not fair as all the surplus is redistributed in favor of a monopolist (Tirole, 1988, ch. 3)[1].

It is worth noting that the above result is received under the assumption that the income of a representative consumer is large enough so that a representative consumer is able to pay its consumer surplus to the monopolist. The current paper relaxes this assumption and it allows the situations where because of the income constraints the representative consumer is not able paying all its consumer surplus to the product provider. The analysis shows that introduction of constraints of the consumers' income may change the welfare implications of the first-degree price discrimination. Namely, the output sold in the absence of price discrimination may turn out being higher than in case the price discrimination strategy is employed by the monopolistic supplier. As a result, the total welfare generated may be higher in the scenario without price discrimination compared to the scenario with price discrimination. This result contrasts with the one, where the income of the representative consumer is assumed being loose enough. It is worth noting that although the welfare may be greater in the scenario without price discrimination, it is still the case that price discrimination allows (weakly) increasing the profit of the monopolistic supplier (compared to the scenario without price discrimination).

The intuition for the result that in the scenario with income constrained consumers the implementation of the first-degree price discrimination may result in a lower social welfare compared to the scenario where the monopolistic supplier does not price discriminate is as follows: the monopolist cannot extract more than the income of a representative consumer in terms of total consumer's payments for the product purchased. In the presence of price discrimination the monopolist is able extracting the whole income of a representative consumer "quicker", that is with the help of a lower number of units of the product sold (compared to the situation, where price discrimination is not allowed).

The result under consideration has implications in comparing the welfare consequences of the linear pricing versus non-linear pricing (e.g. two-part tariffs) of the firms. It is well-known that implementation of the non-linear pricing (e.g. two-part tariffs) can replicate the outcome of the price discrimination. Therefore, the comparison of the regimes "absence of price discrimination" versus "presence of price discrimination" is in some cases equivalent to the comparison of the outcomes of linear pricing with two-part tariff pricing. Thus, the analysis conducted shows that in a framework with income-constrained consumers linear pricing may be welfare-superior compared to the two-part tariffs.

[1] Tirole, J. (1988). *The theory of industrial organization*. MIT press.