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Price discrimination and price dispersion in a duopoly

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Summary

This paper analyses the problem of price discrimination in a market where consumers have heterogeneous preferences both over a horizontal parameter (brand) and a vertical one (quality). Discriminatory contracts are characterized for different market structures. It is shown that price dispersion, i.e. the observed range of prices for each class of customers, increases almost everywhere as competition is introduced in the market.

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1. Introduction

The purpose of this paper is to characterize competition between two rival firms that offer alternative price contracts designed to discriminate between different groups of consumers. Much is known about the analysis of such contracts under monopoly.† In practice, however, discriminatory practices are common in oligopolistic industries, but the economic analysis of this setting is not entirely understood.

The rationale for discrimination stems from the fact that consumers have heterogeneous preferences over product characteristics. By designing different contracts that suit particular categories of users, a firm can expect to match better the preferences of its

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† See Phlips (1983), Varian (1989) and Wilson (1993).

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consumers and then extract a greater surplus from them. If a monopolist producer knew exactly the preferences of his customers (the customer "type"), he would offer the most preferred variety to each type, and then charge a price equal to the surplus created. Obviously, the firm could not ask for an excessively high price, otherwise its potential customers would prefer not to buy. Hence, the problem of the firm is relatively simple, facing only one kind of constraints, usually called "participation" or "individual rationality" (IR) constraints. This would be a case of first-degree price discrimination: allocations are efficient and the firm appropriates the entire surplus. However, perfect discrimination is very unlikely in practice either for legal reasons or because the firm does not observe each type, but is simply aware of its overall distribution. In a context of imperfect information, a producer faces additional constraints. Different contracts, in fact, have to be freely chosen by each consumer. In principle, a bundle designed for low types could be bought also by higher types and *vice versa*, and the producer must be sure that this does not happen. This is what is usually called a "self-selection" or "incentive compatibility" (IC) constraint. It is intuitive that the firm will be more "cautious" with those consumers with a high willingness to pay. One should expect to find efficient allocations for high types, because any other variety would cause a sharp decline in the surplus they enjoy, and this would have to be compensated by a big decline in their price. On the other hand, distortions imposed to low types would have a much lower impact both on consumer surplus and on the firm's profitability. At the same time, distortions on low types can be introduced by the producer in order to make sure that high types will never decide to select a bundle different to the one designed for them.

The argument that we have just sketched in an informal way has received a great deal of attention in the literature, following a seminal paper of Mussa and Rosen (1978) that has initiated a family of principal-agent problems illustrating the equivalence between price discrimination using quantity discounts (second-degree discrimination) and monopoly pricing of products of differing quality. They show that a monopolist offers a quality range that is broader than that required for efficiency (cf. also Maskin & Riley (1983) for a general treatment). This is because by exaggerating quality differences, the firm can effectively screen different customers and discriminate between them, and it is in this respect that non-linear pricing is a particular kind of product differentiation. Efficiency, however, is achieved "at the top", among those customers with the highest willingness to pay.

In the simplest case one could think of, with just two types, one of two situations can arise. If the differences between types are very big, then any attempt to make low types buy the product

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