Price discrimination and the location choice of a durable goods monopoly

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Abstract

Delivered pricing by a spatial monopoly amounts to third degree price discrimination. Well known results in spatial economics show that the monopolist location choice is efficient under delivered pricing and generally inefficient under mill pricing. By contrast, the present paper shows that if the monopolist sells a durable good, the location is also inefficient under delivered pricing.
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1. Introduction

The traditional analysis of the location choice by a monopoly was developed on the basis of static monopolies, namely monopolies selling non-durable goods. In the present paper, I shall analyze a seller of durable goods.

I shall make use of the definition of a 'spatial network', which is familiar to students in spatial economics. Broadly speaking, a location network is a set of interconnected market points. The location of a seller of *non-durable goods* on a network has a long tradition (Weber, 1909) and has been studied extensively; it is known that a private monopoly chooses an inefficient location when it adopts a

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mill pricing policy, and a socially optimal location under delivered pricing (Gabszewicz-Jaskold and Thisse, 1986a). Under mill pricing the consumers bear the transportation cost. However, under delivered pricing the monopolist directly bears the transportation costs; this is why, in this case, the seller chooses the location on the network which is socially optimal, given the quantities he decides to sell.[1] The question in the present paper is whether a monopolist who sells a durable good will locate in the same way as predicted by the theory for standard monopolies.

Although the literature on durable goods monopoly is rather large, it has not considered the location problem. A summary of this literature is beyond the scope of the present paper; however, it is worth recalling some of its fundamental features. In a deterministic context it is well understood that the durable good differs from the static (non-durable) monopoly only if the seller cannot commit to a sequence of prices over time. This absence of commitment creates an incentive to reduce prices in the future; the reason for this is that buyers who have bought in the past do not re-enter the market so that the monopoly can sell only to consumers with a lower and lower valuation of the good. This is known to be harmful to the monopolist, and I shall refer to this situation as the 'Coase problem' from Coase (1972). It can be shown that the monopolist's intertemporal profits in the absence of commitment are lower than they could be under full commitment. The gist of the argument is that consumers will correctly anticipate the price reductions and decide the date of purchase to their convenience. The monopolist is then in competition with its future self, as demand today depends upon prices tomorrow.

Several ways of escaping from the Coase problem by gaining commitment on future prices have been identified in the literature, for instance renting instead of selling (Bulow, 1982), reducing the durability (Bulow, 1986), capacity limits (De Graba, 1995), or raising marginal cost functions (Kahn, 1986; Karp and Perloff, 1996); rationing demand is another possibility (Denicolò and Garella, 1999). I shall show below that locating at some distance from the market nodes on a spatial network is also a way to escape from the Coase problem. Indeed, by locating at a sufficient distance from a given market node, the monopolist creates a lower bound for his future price on that node, exploiting the existence of transport costs. This is a way of buying some commitment on future prices. The need to gain commitment then, as shown below, may lead the monopolist away from the socially optimal location on a location network with several market nodes.

The following analysis is based on a simple example with two market nodes. The case with one market node would boil down to the non-spatial case of a

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[1]Obviously, the quantities need not be socially optimal, so that the optimal location from the social point of view for the socially optimal quantities may still be different from the monopolist's choice. The output effects of price discrimination are discussed in a large literature (see, for instance, Greenhut and Ohta, 1979).