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PRICING COMPETITION WITH INVENTORY CONSIDERATIONS IN A HAZARD RATE-PRONE MARKET OF DURABLES

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Abstract

This paper addresses Bertrand-type pricing competition between two firms producing partially differentiated durables over a finite planning horizon. The demand for durables, characterized by increasing returns of scale to a price reduction, is led by the hazard rate. While the effect of inventories on pricing of non-durables is widely recognized, the management and marketing literature typically overlooks this effect in regard to horizontally competing firms for durables. In this paper we show that the pricing trajectory of durables may significantly alter when inventory dynamics are accounted for. In particular, the price may hike upwards before dropping; gradually grow; or even stay at the same level over the entire product life while it would only decline if inventories and related costs are disregarded. Furthermore, the well-known, optimal pricing strategy of following the pattern of sales does not necessarily confirm even for symmetric equilibria when the competing firms have either an inventory surplus or shortage.

Keywords: competition, pricing dynamics, inventory, durables

1. Introduction

This research is related to the extensive body of literature on differential games in economics, marketing and management sciences in general, and Bertrand-type pricing competition in particular. Since a significant part of that literature has addressed horizontal competition between firms selling both durable and non-durable goods, we only mention here some of the works on this subject; for a more detailed picture please refer to the excellent reviews by Dockner *et al*. (2000), Jørgensen and Zaccour (2004), and Long (2010).

Equilibrium pricing policies for non-durables have been studied according to various dynamics: learning-by-doing (Stokey, 1986; Besanko *et al*. 2010; Kogan and El Ouardighi, 2016); sticky prices (Fershtman and Kamien, 1987; Piga, 2000); and costly output adjustments