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A Monopoly Agent's Optimal Control on Inventory and Prices over a Given Selling Planning Horizon

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Abstract

This paper is explores the linear model of how inventory and selling prices on monopolized goods over a given selling planning horizon. The aim of the model is to determine what quantity of initial ordering should be made and how to control the selling price over time, in order to obtain maximum profit. profit is the difference between the revenue from the goods being sold and the purchasing and holding costs being paid, based on the calculus of variations, we have developed a method to find the optimal solution of the model. With the special characteristics of such a solution, we found that within a time period, after a certain point in time, sales will decrease as time goes on, within this period of time sales will be quickest of first and slowest of the end. With any two points of time, the difference between the selling speed at the former point of time and at the latter point of time shall increase as the unit holding cost increases but will decrease as the slope of the demand function rises, on the extreme conditions, when the nit holding cost is zero or the slope of the demand function is infinite, the selling speed of goods at any two point of time are equal.

Keywords: Monopoly Agent, Inventory; Optimal Control.