Inventory Optimization

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Decision Making in Inventory Management

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Chapter 5
An Inventory Policy for Maximum Fixed Life-Time Item with Back Ordering and Variable Demand Under Two Levels Order Linked Trade Credits

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Abstract In this chapter, an inventory policy of the item with maximum fixed life-time is studied where two levels of trade credit depend on the order quantity. We consider the inventory system in which the supplier is ready to give a mutually agreed credit period to the retailer only if the order quantity purchased by the retailer is larger than the predetermined order quantity. Moreover, to be more practical, the retailer offers a credit limit to the customers. Here, price and time-sensitive demand are debated under the inflationary environment over the finite time horizon. In this study, the shortage is allowed and it is fully backordered. The main objective is to maximize the total profit of the retailer to the fraction of the replenishment cycle and the number of replenishments during the planning horizon. The model is supported by numerical examples. Sensitivity analysis is carried out to derive insights for decision-makers.

Keywords Inventory · Order linked trade credit · Inflation with time value of money · Maximum fixed life-time · Price-sensitive demand · Shortage

5.1 Introduction

In traditional business transactions, it was assumed that the buyer must pay the procurement cost when the products are received. However, in today's competitive markets most companies offer buyer various credit terms like permissible delay in payment, cash discount, etc. to simulate sales and hence reduce inventory. Trade credit has been widely used to boost sales and reduce default risk and attract new customers. In a review of literature for inventory models with trade credit funding,

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