

TWO-WAREHOUSE FUZZY INVENTORY MODEL FOR SINGLE DETERIORATING ITEM WITH TIME DEPENDENT DEMAND AND HOLDING COST UNDER TRADE CREDIT OFFER

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ABSTRACT

In this real business world, the demand for items are fluctuating in each cycle of time, that is, for a specific business cycle time it may decrease, increase or stable. Due to this scenario the supplier allowed to delay in payment, retailer enhances to buy more products at a time, for which the retailers need extra storage. Moreover, the retailer wants to sell the items before the expire date. This article deals with an inventory model for single deteriorating items having decreasing time dependent demand with variable holding cost with two separate warehouse having different protect facilities under trade credit offer has been developed. Further, to illustrate mathematical model, to test the validity of the model, and its solution procedure is discussed in fuzzy environment in order to obtain the optimal retrieval cost and time. Finally, numerical examples are provided to justify the validity of the proposed model, Sensitivity analyses has been performed to describe the effect of the major parameters.

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Key Words. Inventory model, Two-warehouse facility, Variable holding cost, Time dependent demand, Delay in payment, Fuzzy inventory model, Defuzzification, Graded mean integration representation method .

1. INTRODUCTION

The main focus of any business management is to earn more profit by expanding their business and creating new jobs to fulfil customers 'requirement for which they will increasing their market value. In this purpose the inventory management system plays a vital role in any business affairs. It depends on different parameters such as deterioration, shortages, demands, inflations, backlogs, holding cost and trade credit, etc.

The present globalization and modernization of the world, Most of the traders offers a price discount facility or trade credit financing. Which enhances retailers to purchase more than that of the existing capacity of own warehouse. In this regards the retailer may hire new storage for rental basis, some retailers buy a huge amount of products that cannot be stored in existing warehouse when a new product is launched in the market and having high demand or some seasonal products arrives into the market or before big festival offer time .In fact, retailers of many items (Cosmetics, footwear, tiles, instruments, furniture's, etc.) uses their own warehouse at a suitable place in a busy market and that has been furnished with basic facilities to fascinate the buyer to the improvement of their business. Also, retailers can use to rent a secondary warehouse to store the items in some other place by avoiding heavy rent.

Trade credit offer plays major role in inventory management. Allowing the trade credit offer by the supplier to retailers, supplier gets additional orders from existing customers and also fascinate the new customers. For this regards, sales of the supplier increases and in-hand stock level decrease speedily. Thus, the trade credit policy is helpful for the supplier to get more profit by decreasing the inventory cost. On the other hand, by availing trade credit facility retailer can order more quantity with minimal ordering cost and less investment capital. Also, retailer earns the interest on revenue accumulated by selling the items during the credit period.

While developing inventory models most of the authors assume the holding costs as constant. But it is observed that in some real inventory management, the holding cost of items in a rented warehouse (RW)