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OPTIMAL PRICING AND ORDERING POLICIES FOR AN INTEGRATED INVENTORY MODEL WITH STOCK AND PRICE SENSITIVE DEMAND

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Abstract. In this paper we propose an integrated inventory model to maximize joint total profit of supplier and retailer. Display of units play a specific role to boost the demand as it may encourage customers to purchase more, moreover price is also a major factor affecting demand; taking this into consideration the proposed model takes demand rate as stock and price dependent. Mathematical model has been developed under certain assumptions and the objective is to determine optimal number of shipments from supplier to retailer, cycle time and selling price which maximizes the joint total profit of supply chain. Numerical example is presented and sensitivity analysis for some key parameters is carried out to demonstrate the influence on over-all profit, selling price and cycle time. The proposed model is applicable to fast moving consumer goods (FMCG), gallery, super market, bakery products, home textile industry, etc.

Keywords. Integrated model, Optimal Shipments, Price dependent demand, Shelf Space, Stock dependent demand

AMS (MOS) subject classification: 90B

1 Introduction

Deterministic inventory models usually consider the demand rate to be either constant or time-varying but independent of level of inventory i.e. level of stock. However, it has been noted, especially in the retail market, that these inventory models are not suitable for representations of the reality of inventory control situation in the retail field. Levin et.al. [20] quoted that large piles of goods attract more customers this is termed as stock-dependent demand. To incorporate this scenario into inventory models, a variety of stock-dependent demand models have been proposed. Baker and Urban [19], Datta and Pal [24] established inventory model by specifying the stock-dependent demand as a power function of the on hand inventory. Sarker et al. [3] studied the inventory policies for perishable products when