Chapter 8

Setting Two–Tiered Price for Non–Instantaneous Deterioration: Price–Sensitive Quadratic Demand

Nita H. Shah
Gujarat University, India

Urmila B. Chaudhari
Government Polytechnic Dahod, India

Mrudul Y. Jani
Parul University, India

ABSTRACT

To survive in cut-throat competition of today’s business, manufacture gives permissible delay in payment to retailer to increase demand of the product. Here, manufacturer provides permissible delay in payment to retailer. In this chapter, we study inventory control system of non-instantaneous deteriorating item with maximum fixed life-time and two-tiered pricing policy is adopted. The selling prices of product for the non-deteriorating period and the deteriorating period are different. Demand is a function of time and two-tiered selling prices which is more suitable for food industry. In the former, we consider the concept of preservation technology investment to preserve the product and reduce deterioration rate in the inventory system when deterioration start. In later view, we ignore the concept of preservation technology. Due to investment on preservation technology, demand of the product increases and retailer can earn more profit compare to without preservation.

DOI: 10.4018/978-1-5225-3232-3.ch008
INTRODUCTION

A strategic use of price diversity based on customers wealth (irrespective of volumes purchased) in a system settled upon by the global society, including the political power and social security organisations. So, two tiered pricing strategy is very important tool in the global business. The trade credit permits a retailer to accumulate revenue and earn interest during the credit period. Conversely, after the completion of credit period the supplier charges the retailer interest on the due amount. Goyal (1985) studied decision policy by including concept of permissible delay in payments to settle the accounts due against purchases in the classical EOQ model. One can refer to review article by Shah et al. (2010). Sarkar et al. (2010) considered an inventory policy, where retailers are offered a trade credit by the supplier with discount in unit price. They optimized objective function under inflation. Khanra et al. (2013) developed an inventory model for time independent demand by allowing shortages and under trade credit policy. Giri and Maiti (2013) formulated a supply chain model with price and permissible delay in payment sensitive demand under two-level trade credit. Thereafter, trade credit and its variants were given by several researchers. Barrón and Sana (2015) analyzed multi-item EOQ inventory model while demand varies with a promotional effort in a two-layer supply chain. Shah and Chaudhari (2015) analyzed optimal policies for three players with fixed life time and two-level trade credit for time and credit dependent demand. Shah et al. (2015) estimated an economic order quantity model under trade credit and customer returns for price-sensitive quadratic demand. Shah et al. (2016c) studied impact of future price increase on ordering policies for deteriorating items under quadratic demand.

For non-instantaneous deteriorating goods, it is a common exercise to set a higher price when they are not deteriorated and to set a lower price when they begin to deteriorate. Such pricing policy is also called two-tiered pricing, which, however, is occasionally addressed in the previous works. In contrast, the one-tiered pricing of deteriorating items, i.e., the retailer sets only one price for the product all the time, has been widely discussed. Abad and Jaggi (2003) evaluated when end demand is price sensitive, a joint approach for setting unit price and the length of the credit period for a seller. Wu et al. (2014) determined a note on optimal replenishment policies for non-instantaneous deteriorating items with price and stock sensitive demand under permissible delay in payment. Taleizadeh and Nematollahi (2014) constructed an inventory control problem with back-ordering and financial considerations for deteriorating items. Chang et al. (2015) formulated a model on ordering policies and optimal pricing, delay in payments for non-instantaneously deteriorating items under order size dependent demand. Shah and Jani (2016) observed economic order quantity model for non-instantaneously deteriorating item under order size dependent trade credit for prize sensitive quadratic demand.

On the other hand, to reduce deterioration, use of preservation technology which means product preservation, wrapping and storage focuses on the ways in which products can be treated during and after their development in order to maintain their integrity over time by obstructing internal degradation and/or protecting them from external damage. Hsu et al. (2010) evaluated an inventory model with preservation technology investment to minimize the deterioration rate of inventory under constant demand. Dye and Hsieh (2012) estimated an optimal replenishment policy with effective investment in preservation technology for deteriorating items. Hseih and Dye (2013) analyzed a production inventory model incorporating the effect of preservation technology investment under time dependent demand. Recently, Shah and Shah (2014) formulated an inventory model for optimal cycle time and preservation technology investment with price-sensitive stock-dependent demand under inflation for deteriorating items. Shah et al. (2016a) elaborated an integrated production-inventory model under time and price
16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product’s webpage: www.igi-global.com/chapter/setting-two-tiered-price-for-non-instantaneous-deterioration/198688?camid=4v1


Related Content

Systems for Interorganizational Business Process Management
www.igi-global.com/chapter/systems-interorganizational-business-process-management/19703?camid=4v1a

Entropy, the Information Processing Cycle, and the Forecasting of Bull and Bear Market Peaks and Troughs
www.igi-global.com/article/entropy-the-information-processing-cycle-and-the-forecasting-of-bull-and-bear-market-peaks-and-troughs/214952?camid=4v1a

Business Process Models Representation by Deducing Interpretative Evidences on Intuitively Common Symbols
www.igi-global.com/article/business-process-models-representation-deducing/69512?camid=4v1a

B2B and EAI with Business Process Management
www.igi-global.com/chapter/b2b-eai-business-process-management/19702?camid=4v1a