PROFIT INVENTORY MODEL INVOLVES SCREENING COST, DISPOSED COST AND TRANSPORTATION COST

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ABSTRACT

This papermakesprofit inventory model involves screening cost, disposed cost and transportation cost for buyer – vendor. In this developed model damaged products are screened by the buyer and disposed by the vendor. Both buyer and vendor having transportation costmoreover. Furthermore, total profit is likewise determined for buyer and vendor. Finally, numerical models are framing the made model.

Keywords: Inventory, Order Quantity, Disposed cost, Screening Cost, Transportation Cost.
DOI Number: 10.14704/nq.2022.20.11.NQ66436 NeuroQuantology 2022; 20(11): 4308-4310

1. INTRODUCTION

Deterioration is a normal quirk for most things. For instance, food things, vegetables, devices things, etc, debilitate after some time. A coordinated effort between thing debilitating and demand has been thought of. For problematic premium and high rot rate, stock organization has become more trying for the retailer. At the point when demand is known, it is less complex for a retailer to supervise separating things.

Amir Nasiri pour and SomayehNajafiGhobadi [1] dissected ideal selling cost, reestablishment package size and number of shipments for two-echelon creation network model with going to pieces things. BidyadharaBishi et al. [2] cultivated a stock creation procedure for a single limit Weibull crumbling thing with emotional interest and lacks. MasoudRabbani et al. [3] concentrated on seller oversaw stock control framework for breaking down things utilizing metaheuristic calculations. Muniappan et al. [4] considered an integrated money related demand sum model including stock level and item house limit basic. Nita Shah and Monika Naik [5] concentrated on ideal recharging and valuing arrangements for falling apart things with quadratic interest under exchange credit, amount limits and money limits. Ravithammal et al. [6] made an EOQ stock model using logarithmic system with stock level goal. Sekar and Uthayakumar [7] concentrated on advancement of a flawed assembling framework for breaking down things with revamp and deficiency under expansion. Sachin Kumar Verma et al. [8] fostered an EOQ model for decaying things with selling cost subordinate dramatic interest for time changing holding and disintegration costs. Sunil Tiwari et al. [9] concentrated on joint valuing and stock model for crumbling things with lapse dates and halfway accumulating under two-level incomplete exchange credits

inventory network. Zhan et al. [10] dissected motivating forces through stock control in supply chains.

2. ASSUMPTIONS AND NOTATIONS

The model use the following assumptions and notations

Assumptions

(i) The model assumes consistent interest.

(ii) The buyer cost contains ordering cost, holding cost screening cost and transportation cost.

(iii) The vendor contains setup cost, holding x cost disposed cost and transportation cost.

Notations

d Demand rate

k_1 Buyer's ordering cost

k_2 Vendor's setup cost

h_1 Buyer's holding cost

h_2 Vendor's holding cost

Q Economic Order quantity

F_1 Buyer's fixed transportation cost

V_1 Buyer's unit variable cost for order handling and receiving

F_2 Buyer's fixed transportation cost

V_2 Buyer's unit variable cost for order handling and receiving

m Vendor's multiples of order

Percentage of defecting items

y Percentage of scrap items

c_1 Screening cost

c_2 Disposed cost

3. FORMULATION OF THE MODEL

The buyer cost having ordering cost, holding cost, screening cost and transportation cost.

The total cost for buyer can be written as

$$TC_b = \frac{k_1 d}{Q} + \frac{h_1 Q}{2} + \frac{c_1 Q}{2} + F_1 + V_1 Q \quad (1)$$

The vendor cost having setup cost, holding cost, disposed cost and transportation cost.

The total cost for vendor can be written as

$$TC_v = \frac{k_2 d}{mQ} + \frac{h_2 mQ}{2} + \frac{xyc_2 mQ}{2} + F_2 + V_2 Q \quad (2)$$

Equation (1) will be written as

$$TC_b = \left(\frac{h_1 + c_1 + 2V_1}{2}\right) Q + \frac{k_1 d}{Q} + F_1 \quad (3)$$

Equation (3) is of the form $a_1 Q + \frac{a_2}{Q} + a_3$

Q will be taken as, $Q = \sqrt{\frac{a_2}{a_1}}$

$$Q^* = \sqrt{\frac{2k_1 d}{h_1 + c_1 + 2V_1}} \quad (4)$$

Total Profit

Buyer's totalprofit $B_p = \frac{TC^*_b}{TC^*_b + TC^*_v} \times 100$

Vendor's total profit $V_p = \frac{TC^*_v}{TC^*_b + TC^*_v} \times 100$

4. NUMERICAL EXAMPLE

Example 1. Let k_1=300; k_2=500; d=5000; h_1=3$; h_2=4$; c_1=2; c_2=3; F_1=5; F_2=2; V_1=0.2;V_2=0.4; m=4;x=0.1;y=0.2.

The optimal solution is $Q = 745.3560$, $TC_b = 4.0299\ X\ 10^3$, $TC_v = 7.1910\ X\ 10^3$, $Bp = 35.9145$, $Vp = 64.0855$.

5. CONCLUSION

In this paper, profit inventory model involves screening cost, disposed cost and transportation cost for buyer – vendor is investigated. In this model buyer screened and vendor disposed the damaged products and the two of them having transportation cost moreover. In addition, for both buyer and vendor profit cost still up in the air. It is then depicted with the help of numerical models.

The objectives of this paper can likewise be related with various settings including different kinds of demand, multi-items, shortages and so forth.,

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