A two-warehouse inventory model for items with imperfect quality and penalty costs under screening errors

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Abstract

This paper corrects an improper expression in the economic order quantity (EOQ) model with two-warehouses and imperfect quality developed by Chung *et al*. [2009. A two-warehouse inventory model with imperfect quality production processes. Computers & Industrial Engineering 56, 193-197]. The modified model yields a simple and corrected expression for the optimal order quantity and expected profit per unit time. This paper then extends the above idea to a case involving a 100% inspection process with screening errors that may occur under imperfect quality and two warehouses. A model, in which it includes two scenarios, with imperfect quality and penalty costs under screening errors (Type I and Type II error) is developed. The effects of percentage of defective items and screening errors on the optimal solution are investigated. A numerical example is provided for the developed model and its result reveals that the order lot size and expected total profit considering in this paper is less than Chung *et al*. [2009]. Managerial insights are also draw.

Keywords: *Inventory; EOQ; Screening errors; Imperfect quality; Two-warehouse*

1. Introduction

The issue of defective items or imperfect quality has practical importance and has received considerable attention. Rosenblatt and Lee [14] were among the first researchers to focus on this topic in which defective items were assumed to be instantaneously reworked at a cost. They found that the presence of defective items resulted in smaller lot sizes. Porteus [11], at the same time, incorporated the defective item effect into

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