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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