

Modeling and solving a bi-objective single-period problem within incremental discount in framework of solving multi-objective problems approach

Mahsa Najimy

Department of Industrial Engineering, Faculty of Engineering

Kharazmi University

Tehran, Iran

mahsa.najimy@gmail.com

Seyed Hamid Reza Pasandideh

Assistant Professor, Department of Industrial Engineering, Faculty of Engineering

Kharazmi University

Tehran, Iran

shr_pasandideh@khu.ac.ir

Abstract

The single-period problem which is called newsboy problem, is one of the commonplace problem in inventory control. Using inventory control models in each stage of industry cycle has become commonly to determine the order quantities and commodity inventory. In this paper, optimizing a bi-objective, multi-product, multi-constraint, single-period problem is considered with incremental discount policy in purchasing commodity to find the order quantities which will be maximized both the expected profit and the minimized service level. The constraints are budget and the warehouse capacity. In addition, the decision variables are real and it is assumed that the holding and shortage costs occur at the end of the period. The formulation of the problem is presented and shown to be a mixed integer nonlinear programming model. Furthermore, Multi-Objective Decision Making (MODM) approaches are utilized to solve the model with meta-heuristic algorithms. The Genetic algorithm (GA) and the Particle swarm optimization (PSO) are provided to find an approximate optimum solutions of the problem. After applying the RSM method to calibrate the parameters of both algorithms, their performance in solving instances are compared in terms of the solution quality of both algorithms. In final, GAMS is applied for validating their solutions.

Keywords (12 font)

Inventory control; single-period; incremental discount; MODM approaches; meta-heuristic algorithms.

Biography

Mahsa Najimy holds two bachelor degrees in two field of studies, BSc in pure mathematics from University of Tehran, and aerospace engineering from Payam Noor University of Karaj, and also a Master in Industrial engineering from Kharazmi University, Iran. She has published a paper in 11th International Industrial Engineering Conference in 7-8 January 2015.

Seyed Hamid Reza Pasandideh received his BSc, MSc and PhD in Industrial Engineering from Sharif University of Technology, Iran. He is Assistant Professor in the Department of Industrial Engineering at Kharazmi University. His major research concentrations are on Operations Research, Inventory Control and Modelling the applied fields. He was selected as researcher at faculty engineering, Kharazmi University, in 2016. He is an Editor of some Journals such as *International Journal of Supply and Operations Management*. For more details, follow the link:
https://www.researchgate.net/profile/Seyed_Hamid_Reza_Pasandideh2