Variable neighborhood descent heuristic for solving reverse logistics multi-item dynamic lot-sizing problems

Angelo Sifaleras, Ioannis Konstantaras

www.elsevier.com/locate/caor

PII: S0305-0548(15)00235-X
DOI: http://dx.doi.org/10.1016/j.cor.2015.10.004
Reference: CAOR3865

To appear in: *Computers and Operation Research*

Received date: 26 March 2015
Revised date: 29 September 2015
Accepted date: 7 October 2015

Cite this article as: Angelo Sifaleras and Ioannis Konstantaras, Variable neighborhood descent heuristic for solving reverse logistics multi-item dynamic lot-sizing problems, *Computers and Operation Research* http://dx.doi.org/10.1016/j.cor.2015.10.004

Variable neighborhood descent heuristic for solving reverse logistics multi-item dynamic lot-sizing problems

Angelo Sifaleras*

Department of Applied Informatics, School of Information Sciences, University of Macedonia, 156 Egnatia Str., Thessaloniki 54636, Greece

Ioannis Konstantaras*

Department of Business Administration, School of Business Administration, University of Macedonia, 156 Egnatia Str., Thessaloniki 54636, Greece

Abstract

The multi-product dynamic lot sizing problem with product returns and recovery is an important problem that appears in reverse logistics and is known to be NP-hard. In this paper we propose an efficient variable neighborhood descent heuristic algorithm for solving this problem. Furthermore, we present a new benchmark set with the largest instances in the literature. The computational results, demonstrate that our approach outperforms the state-of-the-art Gurobi optimizer.

Keywords: Inventory, Variable Neighborhood Search, Mathematical Programming, Lot Sizing, Reverse Logistics

2010 MSC: 90B05, 90C59, 65K05, 90-08

1. Introduction

Over the past two decades, reverse logistics and closed-loop supply chain have gained substantial interest in business and academia. Evidences can be found in the very recent review papers given by Srivastava [38], Guide and Van

*Corresponding author. Tel: +302310 891884, Fax: +302310 891881

Email addresses: sifalera@uom.gr (Angelo Sifaleras), ikonst@uom.gr (Ioannis Konstantaras)