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ACCEPTED MANUSCRIPT

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

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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

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