Effective Dual-Sourcing Through Inventory Projection

Melvin Drent and Joachim Arts

University of Luxembourg, Luxembourg Centre for Logistics and Supply Chain Management, Rue Richard Coudenhove-Kalergi 6, 1359 Luxembourg, melvin.drent@uni.lu, joachim.arts@uni.lu

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Abstract

Melvin Drent is a third-year PhD candidate in Operations Management at the Luxembourg Centre for Logistics and Supply Chain Management (LCL), which is part of the MIT Global SCALE network. He holds a BSc degree in Industrial Engineering and an MSc degree in Operations Management and Logistics. Both degrees were obtained Cum Laude from the Eindhoven University of Technology. Melvin's PhD research focuses on condition-based maintenance, spare parts management, and dual-sourcing inventory systems. His research is supervised by Joachim Arts.

Joachim Arts is an associate professor at the LCL and holds visiting appointments at the Eindhoven University of Technology and the Center for Mathematics and Computer Science in Amsterdam. Joachim's research interests are in operations research and its applications in supply chain, logistics, maintenance, and business analytics. Much of his research is practice driven as he works with companies such as ASML, Railway operators, Philips, and others. His research has been published in journals such as Operations Research, Transportation Science, European Journal of Operational Research, and IISE Transactions (formerly IIE Transactions). Prior to joining LCL, Joachim was an assistant professor at Eindhoven University of Technology and a visiting scholar at the MIT Sloan school of management. He is a recipient of the European Doctoral Dissertation Award from the European Federation of Operations Research Societies and a Veni career grant from the Netherlands foundation for scientific research.

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University of Luxembourg, Luxembourg Centre for Logistics and Supply Chain Management,
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We consider a single-echelon inventory system under periodic review with two suppliers facing stochastic demand, where excess demand is backlogged. The expedited supplier has a shorter lead time than the regular supplier but charges a higher unit price. We introduce the Projected Expedited Inventory Position (PEIP) policy, and we show that the relative di_erence between the long run average cost per period of this policy and the optimal policy converges to zero when both the shortage cost and the cost premium for expedited units become large, with their ratio held constant. A corollary of this result is that several existing heuristics are also asymptotically optimal in this non-trivial regime. We show through an extensive numerical investigation that the PEIP policy outperforms the current best performing heuristic policies in literature.

Key words : dual-sourcing; inventory; projected inventories; optimal policy; asymptotic optimality