

An Algebraically Derived Minimal Cost Solution Technique of the Integrated Vendor-Buyer Problem

M. A. Hoque¹ and S.K. Goyal^{2,*}

¹Department of Mathematics, Faculty of Science, University Brunei, Darussalam

²Department of Decision sciences and M.I.S. The John Molson Business School Concordia University 1455 deMaisonueva Blvd. Montreal Quebec Canada H3G 1M8

Abstract—Recently an algebraically derived optimal cost solution policy of the integrated vendor-buyer problem with equal sized batch transfer was presented. The solution technique was illustrated with a numerical example and in comparison with two available methods in the literature a significant cost reduction was shown. This paper highlights that the optimal total cost obtained by them is about 5.8% higher than the optimal total cost derived for the same numerical example by another two methods in the literature. In this paper a model of this integrated vendor-buyer problem with equal and unequal sized batch transfer is developed. A simple minimal cost solution technique of the model, derived algebraically, is presented and a solution algorithm is provided. The model is also solved using derivatives and the same results of numerical examples are found. For simplicity the algebraic approach is presented here. For three numerical examples, a comparative study of this approach with one of the best available methods (modified) in the literature is also carried out. For the numerical examples studied, the technique developed in this paper seems to provide better solution.

Keywords—Single-vendor, Single-buyer, Minimal cost, Integrated inventory, Lot and batch sizes

* Corresponding author's email: sgoyal@jmsbconcordia.ca