

**MANUFACTURERS AND BUYERS INTEGRATED PRODUCTION INVENTORY
MODEL WITH BETTER SYNCHRONISATION**

M.S.M. Hisam^{1*}, W.B. Daundasekera², and W.N.P. Rodrigo²

¹Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka

²Department of Mathematics, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka

*mohamedhisam93@gmail.com

Coordinating inventory between multiple manufacturers and buyers is a common practice in the current economic environment. It gives several advantages for both manufacturers and buyers. In the literature, more studies focused on single manufacturer and single/multi buyer(s) integrated production inventory models with various factors. However, limited studies have investigated multi-manufacturer and multi-buyer scenarios. This study investigates multi-manufacturer and multi-buyer integrated production inventory systems. Here, we assume manufacturers produce a homogeneous product and deliver a lot just after its production. Moreover, manufacturers supply their products to all buyers to satisfy buyers' demands. A multi-manufacturer and multi-buyer integrated production inventory model was developed by considering realistic factors and a combination of equal and/or unequal size batch transferring policies. It is assumed that batch sizes follow geometric series whose common ratio is less than 1—subsequently, an optimal solution technique to the proposed model was derived to obtain minimal total cost. Finally, a real-world problem is used to illustrate the analytical findings of the study.

Financial assistance from Postgraduate Institute of Science (PGIS), University of Peradeniya. (Grant No: PGIS/2020/24) is acknowledged.

Keywords: Equal and/or unequal batch size, Integrated production inventory, Multi-buyer, Multi-manufacturer