
How many times to remanufacture in a Richter-type reverse logistics model

Public lecture by Professor Imre Dobos
Gambrinus Fellow, Corvinus University of Budapest, Hungary

8th February 2017, 16:15–17:45
Seminarraumgebäude I (Friedrich-Wöhler-Weg 6), room 3.032

Abstract

We study an integrated production–inventory system that manufactures new items of a particular product and receives some of the used items back after a period of use. These can be either remanufactured on the same production line or disposed of. Used items awaiting remanufacturing need to be held in stock. Both manufacturing and remanufacturing operations require setting up accordingly the production equipment. Compared to manufacturing, remanufacturing may require a different (possibly a lower) unit production cost, while remanufactured items are considered as good as new and can serve the product demand on a par with the new ones. New and as-good-as-new items are kept in stock, from which the product demand is satisfied.

Controlling such a system involves decisions with regard to disposal of used items, succession of manufacturing and remanufacturing operations, and the choice of respective batch sizes. Optimal control needs to strike a balance between production costs, equipment setup costs, inventory-related costs, disposal costs, and others.

Existing research has studied control policies for such production–inventory systems in a variety of different settings. Specifically, beginning with the work of Schrady (1967) and Richter (1996), a significant attention has been devoted to settings assuming deterministic constant demand and return rates. A more recent work has referred to settings assuming variation in quality of returned items (Dobos & Richter 2006) as well as a limited number of remanufacturing cycles that an item can undergo due to wear and tear (El Saadany et al. 2013). We extend this line of research by studying a setting in which used items return in a quality condition that depends on the number of remanufacturing cycles an item has undergone and determines the inventory holding costs of that item. We seek to determine an optimal control policy for such a system. We find that, in certain situations, the optimal control policy is not environmentally friendly.



Zur Person: Prof. Dr. Imre Dobos erhielt 1986 seinen Diplomgrad in Volkswirtschaftslehre von der Karl-Marx-Universität für Wirtschaftswissenschaften in Budapest, Ungarn (heute Budapester Corvinus Universität). Er hat ferner an derselben Hochschule im Fach Betriebswirtschaftslehre promoviert (1992) und habilitiert (2013). Seit 2013 ist er Doktor der Ungarischen Akademie der Wissenschaften. Er war an verschiedenen Universitäten in Europa tätig, darunter an der Europa-Universität Viadrina Frankfurt (Oder), 1994–1999, und Universität Bielefeld, 1999–2000. Seit 2014 ist er Professor für Betriebswirtschaftslehre, insb. Produktion und Logistik, an der Budapester Corvinus Universität.

Herr Dobos hat zahlreiche Beiträge im Bereich der Produktion, Logistik sowie Supply Chain Management geleistet, u.a. zu den Themen Reverse Logistics und Produktaufarbeitung, sowie auch an mehreren Forschungsprojekten mitgewirkt. Sein Forschungsaufenthalt an der Wirtschafts- und Sozialwissenschaftlichen Fakultät der TU Dortmund findet im Wintersemester 2016/17 im Rahmen des Gambrinus-Fellowships statt.