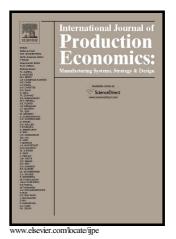
Author's Accepted Manuscript

Carbon emissions and energy effects on a two-level manufacturer-retailer closed-loop supply chain model with remanufacturing subject to different coordination mechanisms



E. Bazan, M.Y. Jaber, S. Zanoni

 PII:
 S0925-5273(16)30154-2

 DOI:
 http://dx.doi.org/10.1016/j.ijpe.2016.07.009

 Reference:
 PROECO6465

To appear in: Intern. Journal of Production Economics

Received date:29 October 2015Revised date:18 April 2016Accepted date:14 July 2016

Cite this article as: E. Bazan, M.Y. Jaber and S. Zanoni, Carbon emissions and energy effects on a two-level manufacturer-retailer closed-loop supply chain model with remanufacturing subject to different coordination mechanisms *Intern. Journal of Production Economics* http://dx.doi.org/10.1016/j.ijpe.2016.07.009

This is a PDF file of an unedited manuscript that has been accepted fo publication. As a service to our customers we are providing this early version o the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain

Carbon emissions and energy effects on a two-level manufacturer-

retailer closed-loop supply chain model with remanufacturing subject to

different coordination mechanisms

E. Bazan^a, M.Y. Jaber^{a*}, S. Zanoni^b

^aDepartment of Mechanical and Industrial Engineering, Ryerson University, 350 Victoria Street, Toronto, ON M5B 2K3, Canada

^bDepartment of Mechanical and Industrial Engineering, Università degli Studi di Brescia, Via Branze, 38, I-25123, Brescia, Italy

*Corresponding author: fax:416-979-5265. mjaber@ryerson.ca

Abstract

This paper presents two models (classical and VMI-CS coordination) for a two-level closed-loop supply chain with a manufacturer and a retailer with a facility to remanufacture used items. The paper considers three critical environmental issues, which are the energy used in production (manufacturing and remanufacturing) processes, GHG emissions from production and transportation activities (subject to a penalty tax), and the number of times to remanufacture (recover) a used item. Numerical results showed that the traditional optimization approach, which minimises the sum of inventory related costs, suggested less remanufacturing, fewer recovery times and more GHG emissions and energy usage; a result of operating at high production rates. The VMI-CS model was shown to be more economical than the classical model for a wide range of manufacturing rates, but not necessarily a more environmentally responsible choice. An extensive numerical analysis was conducted to enrich the discussion and to draw some managerial insights on how to make environmentally conscious decisions.

Keywords: Closed-loop supply chains, green supply chains, greenhouse gas emissions, carbon emissions, remanufacturing, energy

Download English Version:

https://daneshyari.com/en/article/5079079

Download Persian Version:

https://daneshyari.com/article/5079079

Daneshyari.com