

Inventory Analysis for a Manufacturing/Remanufacturing System under Product Substitution

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Abstract

We consider the inventory control problem for a stochastic hybrid manufacturing /remanufacturing system with product substitution in an infinite-horizon and stochastic demand and return settings. Remanufactured products may have an inferior value from customers' point of view and might be seen as not good as new products, which lead to different selling prices and different demand streams for manufactured and remanufactured products. Remanufacturing capacity is mainly limited by the amount of returns which is usually not under the control of the manufacturer. The stock-out situation for remanufactured products can be coped with a substitution strategy according to which the remanufactured product demand is satisfied using new products. We evaluate the profitability of this product substitution strategy under different system parameters such as demand and return rates. The optimal inventory policies are determined using Markov Decision Process analysis. We also provide a performance comparison of several simple-structured inventory policies through numerical experimentations.

Keywords

Product substitution, Remanufacturing, recoverable manufacturing system, inventory policy, Markov decision process

Biography

Fethullah Göçer was born in Elbistan, Turkey on December 25, 1984. For his secondary education, he attended Elbistan İHL High school and graduated in 2001. He attended Suleyman Demirel University Technical Education faculty between 2002 and 2003. He started his undergraduate education in Industrial Engineering at University of Toronto, Canada in 2006 and transferred to Girne American University, Northern Cyprus in 2008. He received his Bachelor of Science degree from Girne American University in 2010. Upon graduation, he went abroad for work experience. He has worked as a Site Engineer for a company in Sierra Leone between 2010 and 2011. He is placed to Kahramanmaraş Sutcu Imam University as research assistant within higher education program of OYP. He is appointed to Galatasaray University for his Master's degree education in Industrial Engineering in 2012. He is currently working as research assistant in the Industrial Engineering Department at Galatasaray University.

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