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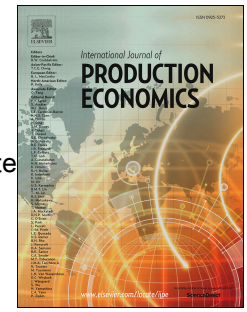

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A Theoretical and Computational Analysis of Lot-Sizing in Remanufacturing with Separate Setups

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Abstract

Due to the stricter government regulations on end-of-life product treatment and the increasing public awareness towards environmental issues, remanufacturing has been a significantly growing industry over the last decades, offering many potential business opportunities. In this paper, we investigate a crucial problem apparent in this industry, the remanufacturing lot-sizing problem with separate setups. We first discuss two reformulations of this problem, and remark an important property with regards to their equivalence. Then, we present a theoretical investigation of a related subproblem, where our analysis indicates that a number of flow cover inequalities are strong for this subproblem under some general conditions. We then investigate the computational effectiveness of the alternative methods discussed for the original problem. Detailed numerical results are insightful for the prac-

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