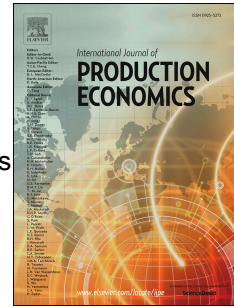


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Production planning for a two-stage production system with multiple parallel machines and variable production rates

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Abstract

This paper studies the case where a manufacturer produces a single type of product on multiple parallel machines. The manufacturer has a machine pool available whose combined production capacity is larger than what is required for producing demand. We assume that the production rates of the machines may be varied within given limits, which gives the manufacturer the opportunity to adjust its total production capacity to demand and to exploit different cost structures of the available machines. In this scenario, the manufacturer has to decide about which machines to select for producing a given demand and how to operate the machines. In addition, the question arises how the product should be shipped to the consumer, given a fixed transportation cost. The paper at hand proposes a deterministic mathematical model for supporting production and distribution planning in this scenario. We analyze the behavior of the proposed model in an extensive numerical experiment using an implementation of the proposed model in a commercial solver.

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