

Kim, T.; Hong, Y.; Lee, J.

Joint economic production allocation and ordering policies in a supply chain consisting of multiple plants and a single retailer. (English) Zbl 1082.90026

Int. J. Prod. Res. 43, No. 17, 3619-3632 (2005).

Summary: This article discusses the production and ordering policies in a supply chain consisting of a single manufacturer and a single retailer. The retailer places orders based on the EOQ-like policy, and the manufacturer purchases raw materials and allocates them to the multiple plants in parallel to produce demand requirement from the retailer. The model is mathematically formulated, and the solution procedure is developed to determine the production cycle length, ordering quantity and frequency, and production allocation ratios for multiple plants. The closed forms of the production cycle length, ordering quantity, and frequency in terms of the production allocation ratios are obtained. It is also shown that the production allocation problem is NP-hard. An efficient and effective heuristic algorithm is proposed to determine the near-optimal production allocation ratios. A numerical experiment demonstrates that the proposed algorithm performs quite satisfactorily.

MSC:

90B30 Production models

90B05 Inventory, storage, reservoirs

90B50 Management decision making, including multiple objectives

Cited in 5 Documents

Keywords:

production and ordering policies; supply-chain management; multiple plants in parallel; production allocation

Full Text: [DOI](#)

References:

- [1] DOI: 10.1016/0925-5273(94)90084-1 · doi:10.1016/0925-5273(94)90084-1
- [2] DOI: 10.1002/(SICI)1520-6750(199609)43:6<765::AID-NAV1>3.0.CO;2-2 · Zbl 0857.90099 · doi:10.1002/(SICI)1520-6750(199609)43:6<765::AID-NAV1>3.0.CO;2-2
- [3] DOI: 10.1016/S0377-2217(02)00407-1 · Zbl 1035.90032 · doi:10.1016/S0377-2217(02)00407-1
- [4] DOI: 10.1016/S0925-5273(02)00274-8 · doi:10.1016/S0925-5273(02)00274-8
- [5] DOI: 10.1016/S0925-5273(01)00093-7 · doi:10.1016/S0925-5273(01)00093-7
- [6] DOI: 10.1016/0377-2217(93)E0357-4 · Zbl 0914.90133 · doi:10.1016/0377-2217(93)E0357-4
- [7] DOI: 10.1016/0377-2217(89)90247-6 · doi:10.1016/0377-2217(89)90247-6
- [8] DOI: 10.1016/S0377-2217(99)00013-2 · Zbl 0948.91017 · doi:10.1016/S0377-2217(99)00013-2
- [9] DOI: 10.1080/095372897235415 · doi:10.1080/095372897235415
- [10] Hahn J, University of Michigan (1990)
- [11] DOI: 10.1016/S0377-2217(96)00267-6 · Zbl 0919.90053 · doi:10.1016/S0377-2217(96)00267-6
- [12] DOI: 10.1016/0925-5273(92)90011-U · doi:10.1016/0925-5273(92)90011-U
- [13] DOI: 10.1016/S0925-5273(02)00357-2 · doi:10.1016/S0925-5273(02)00357-2
- [14] DOI: 10.1016/0377-2217(93)E0253-T · Zbl 0927.90005 · doi:10.1016/0377-2217(93)E0253-T
- [15] Nori VS, *J. Oper. Res. Soc.* 47 pp 930– (1996)
- [16] Parija GR, *IIE Trans.* 31 pp 1075– (1999)
- [17] DOI: 10.1016/0925-5273(92)90084-K · doi:10.1016/0925-5273(92)90084-K
- [18] DOI: 10.1287/mnsc.44.11.S96 · Zbl 0989.90526 · doi:10.1287/mnsc.44.11.S96
- [19] DOI: 10.1137/0203021 · Zbl 0272.68040 · doi:10.1137/0203021
- [20] DOI: 10.1016/0377-2217(94)00277-0 · Zbl 0915.90138 · doi:10.1016/0377-2217(94)00277-0

[21] DOI: [10.1080/002075400422734](https://doi.org/10.1080/002075400422734) · Zbl [1093.90506](https://zbmath.org/journal/Zbl1093.90506) · doi:[10.1080/002075400422734](https://doi.org/10.1080/002075400422734)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.