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Integrated multi-site aggregate production-pricing planning in a two-echelon supply chain with multiple demand classes. (English) [Zbl 07166424](#)

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Summary: This paper proposes a production and differential pricing decision model in a two-echelon supply chain that involves a demand from two or more market segments. In this framework, the retailer is allowed to set different prices during the planning horizon. While integrated production-marketing management has been a key research issue in supply chain management for a long time, little attention has been given to set prices and marketing expenditures in integrated multi-site (parallel) manufacturing systems and multiple demand classes. Generally, the presence of multiple demand classes induced by different market segments may impose demand leakage and then change production plan and ordering policies throughout the supply chain system. To tackle this problem, this paper develops a novel approach in order to provide an optimal aggregate production and marketing plan by interconnecting the sales channels of the retailer and demand. A non-linear model is established to determine optimal price differentiation, marketing expenditures and production plans of manufacturing sites in a multi-period, multi-product and multi-sale channels production planning problem by maximizing total profit of the supply chain. To handle the model and obtain solutions, we propose an efficient analytical model based upon convex hulls. Finally, we apply the proposed procedure to a clothing company in order to show usefulness and significance of the model and solution method.

MSC:

90-XX Operations research, mathematical programming

91-XX Game theory, economics, finance, and other social and behavioral sciences

Keywords:

mathematical optimization; price discrimination; channel-based retailing; multi-site production plan; textile supply chain; convex hulls

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