

A parallel between two models in Economics and OR: Product Line Design versus Bilevel Price Optimization

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1 A tale of two models

In this talk, we contrast two pricing models that have lived in parallel for some time. The older one is a semi-classical model in economics, called “Product Line Design”, where the revenue-maximizing pricing policy of a firm must take into account the purchase of products by utility-maximizing customers (Dobson and Kalish [1]). More recently, Labbé et al [2] set the problem of devising revenue-maximizing tolls on a multicommodity transportation network within the framework of bilevel programming, a branch of optimization that deals with mathematical programs whose constraint set is defined by an auxiliary problem, and is closely related to Stackelberg games in economics.

The aim of this presentation is to provide an overview of results, either theoretical (worst-case complexity), methodological (applications) or numerical (exact or heuristic algorithms), associated with both the original models and variants thereof. Throughout, we will highlight the relationships between these models, as well as their treatment by the communities of researchers in operations research, economics, and even theoretical computer science.

References

1. G. Dobson and S. Kalish. Positioning and Pricing A Product Line. *Marketing Science*, 7(2), 107-125.
2. M. Labbé, P. Marcotte and G. Savard (1998). A Bilevel Model of Taxation and its Application to Optimal Highway Pricing. *Management Science*, 44(5), 1608-1622.