Kunnumkal, Sumit; **Topaloglu, Huseyin**
A refined deterministic linear program for the network revenue management problem with customer choice behavior. (English) Zbl 1152.90488

Summary: We present a new deterministic linear program for the network revenue management problem with customer choice behavior. The novel aspect of our linear program is that it naturally generates bid prices that depend on how much time is left until the time of departure. Similar to the earlier linear program used by *G. van Ryzin* and *Q. Liu* [M & SOM 10, 288–310 (2008)], the optimal objective value of our linear program provides an upper bound on the optimal total expected revenue over the planning horizon. In addition, the percent gap between the optimal objective value of our linear program and the optimal total expected revenue diminishes in an asymptotic regime where the leg capacities and the number of time periods in the planning horizon increase linearly with the same rate. Computational experiments indicate that when compared with the linear program that appears in the existing literature, our linear program can provide tighter upper bounds, and the control policies that are based on our linear program can obtain higher total expected revenues.

MSC:

90B50	Management decision making, including multiple objectives
90C05	Linear programming
91B42	Consumer behavior, demand theory

Cited in **13** Documents

Keywords:

revenue management; linear program; customer choice

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