

Data-Driven Dynamic Overbooking Model for Tour Operators

Authors : Kannapha Amaruchkul

Abstract : We formulate a dynamic overbooking model for a tour operator, in which most reservations contain at least two people. The cancellation rate and the timing of the cancellation may depend on the group size. We propose two overbooking policies, namely economic- and service-based. In an economic-based policy, we want to minimize the expected oversold and underused cost, whereas, in a service-based policy, we ensure that the probability of an oversold situation does not exceed the pre-specified threshold. To illustrate the applicability of our approach, we use tour package data in 2016-2018 from a tour operator in Thailand to build a data-driven robust optimization model, and we tested the proposed overbooking policy in 2019. We also compare the data-driven approach to the conventional approach of fitting data into a probability distribution.

Keywords : applied stochastic model, data-driven robust optimization, overbooking, revenue management, tour operator

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