Valid Inequalities for a Stochastic Multi-stage Problem of Discrete Cargo Supply with Lead Times

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The problem addresses the cost minimization of meeting the uncertain demand of fuel during a time planning horizon. The supply of the product is provided by the adquisición of optional shipments, which have a fixed volume and a delivery time. Due to the uncertainty and the passage of time, corrective actions as cancelation and postponement of the shipments can be taken with associated costs and delays. The problem is modeled as an extension of the discrete lot-sizing problem with varying capacities, uncertain parameters [1] and delivery times [2]. In order to construct a tighter formulation, valid inequalities are generated from a knapsack set relaxation of the model [3]. Computational experiments are performed on the resolution of the model and its variant for instances of different structures of uncertain information. The experimental results allow to conclude that the variant enables a more efficient resolution than the original model.

References

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