

Data-driven robust option pricing

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Traditional option pricing methods rely on perfect knowledge of the stochastic process governing the underlying asset price. However, the underlying probability distribution is usually unknown or subject to estimation and modeling errors. In this context, option pricing via robust optimization is a flexible and computationally efficient framework that only. However, the robust option pricing framework, first presented by [1], define the uncertainty set based on strong assumptions over the underlying price dynamics. In this work, we propose a novel option pricing framework using a robust optimization model with data-driven polyhedral uncertainty as in [2]. Completely determined by a data-sample, the proposed uncertainty set embeds a non-parametric time dependence of the underlying price and leads to a computationally tractable robust counterpart. We provide empirical evidence that the proposed framework outperforms selected benchmarks on a out-of-sample analysis.

References

- [1] BANDI, C., BERTSIMAS, D., *Robust option pricing*, European Journal of Operational Research, 239(3):842-853, 2014.
- [2] FERNANDES, B., STREET, A., VALLADÃO, FERNANDES, C., *An adaptive robust portfolio optimization model with loss constraints based on data-driven polyhedral uncertainty sets*, European Journal of Operational Research, 255(3):961-970, 2014.