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Title: “From Bachelier to Dupire via Optimal Transport”

Abstract

Famously mathematical finance was started by Bachelier in his 1900 PhD thesis where –among many other achievements – he also provides a formal derivation of the Kolmogorov forward equation. This forms also the basis for Dupire’s (again formal) solution to the problem of finding an arbitrage free model calibrated to the volatility surface. The later result has rigorous counterparts in the theorems of Kellerer and Lowther. We revisit these hallmarks of stochastic finance, highlighting the role played by some optimal transport results in this context.

Joint work with Mathias Beiglböck and Gudmund Pammer