Kolloquium über Mathematische Statistik und Stochastische Prozesse

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Representable Options

Abstract:

We call a given American option representable if there exists a European claim which dominates the American payoff at any time and such that the values of the two options coincide within the continuation set associated to the American claim. This concept has interesting implications from a probabilistic, analytic and financial point of view. Above that, it provides the practitioner with a new method for American option pricing.

We aim at analyzing and linking together the mathematical notions of representable American claims, embedded American payoffs (in the sense of Jourdain and Martini, 2001) and cheapest dominating European options. This process reveals a new duality structure between European and American valuation problems which we deem as very fruitful for future research. Relying on methods from infinite-dimensional optimization, we make a first step towards verifying representability of certain American claims. Furthermore, we will present some numerical results and compare our pricing algorithm to high-precision methods from the literature.

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