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Original Article

The fair value of guaranteed annuity options

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Abstract

We discuss the fair valuation of Guaranteed Annuity Options, i.e. options providing the right to convert deferred survival benefits into annuities at fixed conversion rates. The use of doubly stochastic stopping times and of affine processes provides great computational and analytical tractability, while enabling to set up a very general valuation framework. For example, the valuation of options on traditional, unit-linked or indexed annuities is encompassed. Moreover, security and reference fund prices may feature stochastic volatility or discontinuous dynamics. The longevity risk is also taken into account, by letting the evolution of mortality present stochastic dynamics subject not only to random fluctuations but also to systematic deviations.

Keywords:

Fair value   Options to annuitize   Stochastic mortality   Longevity risk   Financial risk

Doubly stochastic stopping times   Affine processes

Notes

[1]We are grateful to Freddy Delbaen for clarifying these points.

Related Research Data

DEFAULT RISK INSURANCE AND INCOMPLETE MARKETS[1]
Source: Mathematical Finance

Guaranteed Annuity Options
Source: Astin Bulletin

Stochastic Duration and Fast Coupon Bond Option Pricing in Multi-Factor Models
Source: SSRN Electronic Journal

A General Version of the Fundamental Theorem of Asset Pricing (1994)
Source: Unknown Repository

A YIELD-FACTOR MODEL OF INTEREST RATES
Source: Mathematical Finance

Recursive valuation of defaultable securities and the timing of resolution of uncertainty
Source: The Annals of Applied Probability

On the optimality of equilibrium when the market structure is incomplete
Source: Journal of Economic Theory

Applied Mathematical Demography

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