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Contingent claim pricing using probability distortion operators: methods from insurance risk pricing and their relationship to financial theory

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Abstract

This paper considers the pricing of contingent claims using an approach developed and used in insurance pricing. The approach is of interest and significance because of the increased integration of insurance and financial markets and also because insurance-related risks are trading in financial markets as a result of securitization and new contracts on futures exchanges. This approach uses probability distortion functions as the dual of the utility functions used in financial theory. The pricing formula is the same as the Black-Scholes formula for contingent claims when the underlying asset price is log-normal. The paper compares the probability distortion function approach with that based on financial theory. The theory underlying the approaches is set out and limitations on the use of the insurance-based approach are illustrated. The probability

distortion approach is extended to the pricing of contingent claims for more general assumptions than those used for Black-Scholes option pricing.

Keywords:

Contingent Claim Pricing | Probability Distortion Functions | Non-expected Utility | Insurance Pricing | Black And Sholes

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