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Valuation of Financial Derivatives Subject to Credit Risk

Abstract: We study valuation of derivative securities involving credit risk. First for risky debt, reduced form approach is adopted, in which a discrete time binomial model for the term structure is exogenously specified. We derive the risk-neutral multi-period pricing formula and the arbitrage-free dynamics. Time series models are also incorporated with the log odds ratios of bankruptcy probabilities to obtain pricing formulae for risky bond. Empirical cases are studied. Secondly for vulnerable option, structural approach is adopted, a bivariate geometric Brownian motion is used to model the firm values and stock prices. A useful factorization formula is obtained to approximate vulnerable option values. Simulation studies are also performed.