The Double-barrier Default of a Time-homogeneous Diffusion Model

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Abstract

We are interested in the default risk of a firm. Let $a < b$ and $c > 0$ be three exogenously determined constants, with a interpreted as the liquidity threshold, b as the reorganization threshold and c as the grace period. The firm is considered as defaulted whenever its value either goes below level a or constantly stays below level b for c units of time. Economic justifications for this concept of default are the US bankruptcy codes Chapter 7 (Liquidation) and Chapter 11 (Reorganization). We model the firm value by a time-homogeneous diffusion process and derive an explicit formula for the default probability.

Keywords: Default; Partial differential equation; Strong Markov property; Time-homogeneous diffusion

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