

Pricing Zero-coupon Bond and CDS under a Structural Credit Risk Model with Regime Switching

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Abstract

In this paper, we consider a defaultable firm with its market value being defined as a geometric jump-diffusion risk process with regime switching. We investigate the price and the fair premium for the zero-coupon bond under the proposed structural credit risk model. The price and the fair premium rely on the Laplace transform of the expected discounted loss of the market value at default time. Integro-differential equations for the Laplace transform of the expected discounted loss are obtained. Closed form expression for the Laplace transform are derived by solving the Integro-differential equations when the common distribution of jumps is double mixed exponential distribution. By inverting the Laplace transform we give some numerical results to show the impact of the parameters in the model on the price and the fair premium.

Keywords: Default probability; Fair premium; Zero-coupon bond; Laplace transform; Expected discounted loss at default time