

Pricing a defaultable bond using Lévy model

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Abstract

When evaluating a defaultable bond with intensity form model, the default risk is usually assumed to be influenced by the state variables (i.e., macroeconomic variables). In traditional studies, a closed-form valuation model can be obtained when the state variables are assumed as Weiner processes. In this paper, we derive the closed-form valuation formula for a defaultable bond when the state variables follow Lévy processes. Some examples are illustrated to show the application of our formulas. We also support a new method for the estimation of parameters in Lévy processes. Because the specification of Lévy process is more accurate and elastic to model the distributions of state variables, our valuation model is also more accurate and elastic.

Keywords: reduced-form model, default risk, Lévy process