

A Unified Credit Risk Model: A Structural Model with Stochastic Volatility & A Reduced Form Model with Stochastic Intensity

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Abstract

In recent years some papers have tried to bridge the gap between the two main approaches in credit risk modelling: structural and reduced form models. We propose a unified approach that models the credit default event as the minimum of the two default times, one from the structural default and the other from the exogenous intensity.

In particular, we look at the effect of having stochastic volatility in the structural approach. We study the effects of time scales on the credit spread yield curves both for the stochastic volatility and the stochastic intensity. We show that having a short time scale in the stochastic volatility raises the credit spreads at short maturities and having a long time scale in the intensity gives some flexibility for the yield curve at long maturities. And in this framework we use perturbation analysis to derive closed-form approximations for the credit spreads that would ease the work of calibration of parameters.

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