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*Title:* Structural Credit Modeling under Stochastic Volatility.

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# Structural Credit Modeling under Stochastic Volatility

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## Abstract

This paper presents a structural credit model with underlying stochastic volatility, a CIR process, combining the Black/Cox framework with the Heston Model. We allow to calibrate a Heston Model for a non-observable process as underlying of the Black/Cox Model. A closed-form solution for the price of a down-and-out call option on the assets with the debt as barrier and strike price is derived using the concept of optional sampling. Furthermore, estimators are derived with the Method of Moments for Hidden Markov Chains. As an application of this model, the default probabilities of Merrill Lynch are examined during the financial crisis.

**Key Words:** *Credit Models, Barrier Options, Stochastic Volatility, Black/Cox Model, Heston Model*