

# Specification Analysis of Structural Credit Risk Models\*

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## Abstract

In this paper we conduct a specification analysis of structural credit risk models, using term structure of credit default swap (CDS) spreads and equity volatility from high-frequency return data. Our study provides consistent econometric estimation of the pricing model parameters and specification tests based on the joint behavior of time-series asset dynamics and cross-sectional pricing errors. Our empirical tests reject strongly the standard Merton (1974) model, the Black and Cox (1976) barrier model, and the Longstaff and Schwartz (1995) model with stochastic interest rates. The double exponential jump-diffusion barrier model (Huang and Huang, 2003) improves significantly over the three models. The best model is the stationary leverage model of Collin-Dufresne and Goldstein (2001), which we cannot reject in more than half of our sample firms. However, our empirical results document the inability of the existing structural models to capture the *dynamic* behavior of CDS spreads and equity volatility, especially for investment grade names. This points to a potential role of time-varying asset volatility, a feature that is missing in the standard structural models.

**JEL** Classification: G12, G13, C51, C52.

**Keywords:** Structural Credit Risk Models; Credit Default Swap Spreads; High Frequency Equity Volatility; Consistent Specification Analysis; Pricing Error Diagnostics.

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