

Department of Decision Sciences

Statistics Seminar

Statistical inference in structural credit risk models: Likelihood and Bayesian approaches

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Abstract

Structural credit risk models have become widely popular as a tool to assess the creditworthiness of corporations because they allow us to price risk based on fundamentals such as the firm's asset prices, and because they provide a direct link between equity and debt markets.

However, the practical application of these models is complicated by the fact that the firms's asset prices are generally not directly observable and must be estimated, along with other model parameters, from available high frequency market data such as equity and debt prices.

With limited exceptions, most of the "calibration" approaches typically used in recent empirical studies that use credit risk models are ad-hoc procedures that try to reconstruct the volatility of assets from the equity volatility in order to obtain asset prices.

As an alternative, this talk discusses the use of formal statistical inference procedures in the context of structural credit risk models.

We discuss both frequentist (maximum likelihood) and Bayesian approaches. However, we argue that, since parameter uncertainty can have a big influence on spreads, Bayesian approaches are more appropriate in this context and allow us to partially explain the "credit spread puzzle".

This is joint work with Samuel Malone (Universidad de los Andes) and Enrique ter Horst (Euromed Management).