

MASTER'S SEMINAR ANNOUNCEMENT
Department of Statistics

A Comprehensive Model for Bond Portfolio Risk Management

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ABSTRACT

The International Swaps and Derivatives Association states "Leading international banks believe that the use of sophisticated portfolio credit risk measurement models will increase significantly. The banks suggest that the efficient and effective use of these systems is of prime importance for the measurement and management of credit risk exposures and to support swift adjustments in bank exposures in response to changing market conditions."

Capital adequacy policy reform by the Bank for International Settlements will soon allow much leeway in measuring risk for banks. This article details a comprehensive model to deal with both credit risk and market risk. JP Morgan's CreditMetrics model, and the closely related KMV model, are used to measure credit risk. The credit risk component of model will account for the probability of default, and loss given default. Furthermore, this probability of default will be independent of the economic cycle, and thus periods of extreme numbers of defaults. The credit risk model also responds more quickly to changes in a firm's financial position than does a model based on external credit ratings, which are adjusted on a relatively infrequent basis. Short-term risk free interest rates will be simulated using the Ait-Sahalia model, or a similar model of which the Ait-Sahalia is a general case. Appropriate credit spreads are then calculated to add to these simulated forward rates to generate forward curves for each of the seven credit rating categories. This method for calculating credit spreads is taken from a paper by E. Altman and M. Onorato. This method links market risk and credit risk through the loss given default, and indirectly through the probability of default. This model is best suited to risk management for publicly traded entities.