

## Probability of Default in Credit Risk Based on Discrete Trinomial Structure

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### Abstract

Credit risk modeling has been the subject of considerable research interest in finance and has recently drawn the attention of statistical researchers. The distributions of defaults and transitions play the central role in the modeling, measuring, and managing of credit risk. Discrete Binomial Structure is one of the oldest approach to estimate default that defines a corporate bond in two states: default and no default at every period. This paper will introduce extended model for discrete binomial structure, namely Discrete Trinomial Structure. Discrete Trinomial Structure defines a corporate bond in three categories: investment grade, speculative grade, or default. We want to estimate probability of default of a corporate bond in the end of time maturity of the bond in each category. The result of this research is cumulative default probability from now until period  $T$  based on multiperiod default tree.

**Keywords:** mutiperiod default tree, rating category, reduced form model, transition matrix