

Title:
Asymmetric Counterparty Relations in Default Modeling

Author(s):
Sergey Terentyev

Technical Report number (Dept. of Statistics, Stanford Univ.):
2004-8

Date:
July 2004

Abstract:

Abstract

We present a new model for the times of default of several interconnected firms. The model focuses on the counterparty relations between the firms and is capable of capturing asymmetry in these relations. Asymmetric counterparty relations have been relatively unexplored in the default modeling literature.

We present a method for the estimation of our model. According to this method, the model is decoupled into two parts that are estimated separately. The first part describes the dynamics of default probabilities of each firm when no other party influences it. We can make use of the large body of literature on default of a single obligor for developing this part of the model. The second part describes the counterparty relations and is rich enough to allow for a complex network among the firms.

We compare the pricing results implied by our model to those implied by standard methods. We show that our model offers more accurate prices of credit spread options and has the potential for performing better in pricing collateralized debt obligations and basket default swaps. We also show that the structure of the model is related to the structure of Polya's urn scheme.