

**February 14<sup>th</sup>, 2020**  
**KAP 414**  
**3:30 P.M. – 4:30 P.M.**

**Professor Bin Zou**  
(University of Connecticut)

**“A Set-Valued Markov Chain Approach to Credit Default”**

**Abstract:** We propose a novel credit default model that takes into account the impact of macroeconomic factors and intergroup contagion on the defaults of obligors. We use a set-valued Markov chain to model the default process, which includes all defaulted obligors in the group. We obtain analytic characterizations for the default process and derive pricing formulas in explicit forms for synthetic collateralized debt obligations (CDOs). Furthermore, we use market data to calibrate the model and conduct numerical studies on the tranche spreads of CDOs. We find evidence to support that systematic default risk coupled with default contagion could have the leading component of the total default risk.

**Key words:** credit risk; collateral default obligation (CDO); Markov chain; jump diffusion; tranche spread

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