Department of Statistics

MASTER'S THESIS PRESENTATION

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Introduction to the Semiparametric Dynamic Max-Copula model and an Application to Financial Time Series Data

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ABSTRACT

Many factors were attributed to the 2008 financial crisis that led the American economy into the Great Recession. Coval et al. (2009) argues that the inadequacy of Gaussian copulas to accurately price model assets in times of crisis was one of the prominent causes for the financial collapse. This inspired research into mixtures of copulas composed of already existing copulas that are malleable enough to capture tail-dependence more suited for extreme financial events. By construction, the mixture copula inherits components from its parents that may not have as strong of a tail-dependence (when desired) as one of their parents may have on their own. Thus, the mixing-idea was extended further to the max-copula model presented by Zifeng Zhao and Zhengjun Zhang (2017). The max-copula model offers both stronger tail-dependence than the mixture copula as well as retains its Gaussian structure in non-extreme time intervals. This paper attempts to replicate the simulation results of the max-copula model and explores model performance for value at risk (VaR) estimation for financial portfolios.