THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

Master's Thesis Presentation

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"Forecasting Systemic Tail Risk in the Technology Sector Using Dynamic CoVaR Models"

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Abstract

This thesis studies dynamic CoVaR modeling for systemic tail-risk forecasting. Using the CoCAViaR framework, VaR and CoVaR are modeled directly rather than derived from a full conditional distribution. A simulation study shows that the two-step estimator performs reasonably well, although CoVaR parameters are harder to estimate due to the smaller number of tail observations. Empirically, the thesis examines tail-risk spillovers from large technology stocks to the Nasdaq 100 using daily data from 2015 to 2025. Forecasts are evaluated by VaR and CoVaR scores, exceedance rates, and the Fissler–Hoga test, with forecast days further classified into high- and low-VIX regimes. The results suggest that dynamic CoVaR models are useful for technology-sector tail-risk forecasting, but performance is regime-dependent: calibration is stronger in low-volatility periods, while high-volatility periods remain more difficult to forecast.

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