



THE UNIVERSITY OF
CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Confidence Intervals for ARMA-GARCH VaR: The Case of Heavy
Tails and Skewness

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Jones 226, 5747 S. Ellis Avenue

ABSTRACT

It is well-known that the asymptotic distribution of the quasi-maximum likelihood estimator may not be normal when the ARMA-GARCH model errors lack a finite fourth moment. In such a scenario, simulations show that the conventional n -out-of- n with-replacement bootstrap, despite its inconsistency, provides accurate confidence intervals for ARMA GARCH VaR in case of various symmetric error distributions without finite fourth moment. However, in the presence of skewed error distributions without finite fourth moment, conventional bootstrap and several other methods fail to estimate confidence intervals. A residual subsample bootstrap is proposed to obtain confidence intervals for ARMA-GARCH VaR. This method produces confidence intervals with asymptotically correct coverage rates under very mild conditions.

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