



THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Assessing the Sensitivity of Value at Risk Estimation for Sub-Additive Portfolios

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ABSTRACT

Regulators around the world have used Value at Risk (VaR) models as a standard for quantifying the worst case potential loss on investment since its incorporation into the 2004 Basel II accords. It has been shown, however, that the VaR family of models is an inadequate measure of risk in terms of the coherent axioms put forward by Artzner, et al.,(1997). Specifically, VaR does not adhere to the sub-additivity axiom that corresponds to the fundamental idea of diversification put forth in the finance literature. In this paper we investigate the coherent quality of several standard GARCH models, in tandem with the empirical violation rates, to determine the optimal GARCH based VaR model. We do this by fitting each model to 100 randomly built portfolios of 5 components that are equities within the S&P 500. We then again fit the models to another 100 portfolios of size 10 whose components are randomly chosen combinations of two of the previously sampled smaller portfolios.

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