



THE UNIVERSITY OF
CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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**Comparing Univariate and Multivariate Models to
Forecast Portfolio Value-at-Risk**

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ABSTRACT

Value-at-Risk has become one of the most widely-used financial risk measurement techniques. In this paper, we compare multivariate and univariate Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models in terms of their respective performance in forecasting portfolio Value-at-Risk (VAR). First, we review a few common VaR models both in a univariate and a multivariate setting. Then, we use backtesting methods and CPA test on these models with both simulated and real data of diversified portfolios containing a large number of assets. Last, we rank the models with regards to their comparative forecasting ability. We conclude that on an out-of sample basis, multivariate models have better performance than their univariate counterparts. In particular, we find that, in most cases, the dynamic conditional correlation model with Student's t errors outperform all the other models considered in this paper.

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