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T. Berger, M. Missong

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## Financial Crisis, Value-at-Risk Forecasts and the Puzzle of Dependency Modeling

T. Berger<sup>a,\*</sup>, M. Missong<sup>a</sup>

<sup>a</sup> *University of Bremen, Wilhelm-Herbst-Str. 5, 28359 Bremen, Germany.*

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### Abstract

Forecasting Value-at-Risk (VaR) for financial portfolios is a crucial task in applied financial risk management. In this paper, we compare VaR forecasts based on different models for return interdependencies: volatility spillover (Engle and Kroner (1995)), dynamic conditional correlations (Engle (2002), (2009)) and (elliptical) copulas (Embrechts et al. (2002)). Moreover, competing models for marginal return distributions are applied. In particular, we apply extreme value theory (EVT) models to GARCH-filtered residuals to capture excess returns.

Drawing on a sample of daily data covering both calm and turbulent market phases, we analyze portfolios consisting of German Stocks, national indices and FX-rates. VaR forecasts are evaluated using statistical backtesting and Basel II criteria. The extensive empirical application favours the elliptical copula approach combined with extreme value theory (EVT) models for individual returns. 99% VaR forecasts from the EVT-GARCH-copula model clearly outperform estimates from alternative models accounting for dynamic conditional correlations and volatility spillover for all asset classes in times of financial crisis.

*Keywords:* Financial Crisis, Portfolio Value-at-Risk, Dynamic Conditional Correlations, Elliptical Copulas, Extreme Value Theory

*JEL classifications:* C58, G01, G11

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\*Corresponding author (tel: +49 421 218 66903, fax: +49 421 218 66902).

*Email addresses:* [theoberger@uni-bremen.de](mailto:theoberger@uni-bremen.de) (T. Berger), [missong@uni-bremen.de](mailto:missong@uni-bremen.de) (M. Missong)

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