

Report on Rigorous Thesis

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Title of the thesis:	Multivariate Dependence Modeling using Copulas

The thesis is focused on comparison of several multivariate GARCH models. Author's main research question is whether a copula-based type multivariate volatility model is able to describe dependency structure better than a dynamic conditional correlation GARCH (DCC-GARCH) model. The thesis is divided into seven parts. I really appreciate author's choice of his research area as correct asset correlation modeling is one of the main issues arising from the recent crisis.

The thesis is well written and author is obviously able to present rather difficult issues in an understandable way. For me the most interesting is the empirical part of the thesis, i.e. chapters 5 & 6, where author compares several copula based GARCH models with a DCC-GARCH on a sample of several stocks and stock indices. Author chose to model bivariate dependency of several asset pairs: the Czech PX stock index and CEZ, KB and ERSTE, Unipetrol and Telefonica (all traded on the Czech stock market) and finally NASDAQ and S&P stock indices. The analysis shows that, except Unipetrol and Telefonica, copula-based models are able to explain the dependency structure slightly better than the DCC-GARCH.

Additionally to the Master thesis, the author added calculations for S&P400 and NASDAQ100 indices. It is very interesting to compare the results from the US indices with those from Czech ones.

However, the author did not incorporate my comment regarding some statistical test of residuals. Therefore, compared to the Master thesis, I give lower amount of points for methods. Another issue which remained from the Master thesis is the bad work with tables and figures. These are often in a different section that they refer to. On the other hand, the work is still excellent and therefore I recommend it for a defense.

SUMMARY OF POINTS AWARDED (for details, see below):

CATEGORY	POINTS
<i>Literature</i> (max. 20 points)	17
<i>Methods</i> (max. 30 points)	23
<i>Contribution</i> (max. 30 points)	25
<i>Manuscript Form</i> (max. 20 points)	18
TOTAL POINTS (max. 100 points)	83
(doporučuji, nedoporučuji)	doporučuji

NAME OF THE REFEREE: Petr Gapko

DATE OF EVALUATION: 13. 3. 2013



Referee Signature