

**Р. А. К о л д а н о в, N. N. L o z g a c h e v a** (Nizhny Novgorod, Russia, National Research University Higher School of Economics, Laboratory of Algorithms and Technologies for Network Analysis). **About multivariate stock returns distribution.**

Popular multivariate model in financial analysis is the class of elliptically contoured distributions [1]. Consistency of real data with elliptically contoured model was studied in [2] where it was shown that the joint distribution of real market stock returns is not in accordance with hypothesis of elliptical distributions. This result is obtained by comparison of dependence measures of pairs of stock returns. However, as pointed by the authors, their methodology differs from usual hypothesis testing using statistical tools. In the case of large stock market the number of pairs of stocks is huge and it is necessary to take into account so called multiplicity phenomenon [3, Ch. 9].

In the present paper we analyze elliptical model for stock returns distribution from multiple hypotheses testing theory point of view [3, Ch. 9]. Our main goal is to detect pairs of stocks for which elliptical model hypotheses are rejected and study associated rejection graph. Multiple statistical procedure for testing elliptical model for stock returns distribution is proposed. Sign symmetry conditions are chosen as individual hypotheses for multiple testing. Distribution free uniformly most powerful tests of the Neyman structure are constructed for individual hypotheses testing. Associated stepwise multiple testing procedure is applied for the real market data. Numerical experiments shows that hypothesis of elliptical model is rejected. At the same time it is observed that the graph of rejected individual hypotheses has unexpected structure. Namely, this graph is sparse and has a few hubs of high degree. Removing this hubs leads to non-rejection of hypothesis of elliptical model.

**Acknowledgements:** The work is supported by RHRF grant 15-32-01052.

#### REFERENCES

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