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MULTIVARIATE STATISTICAL ANALYSIS IN THE STUDY OF CAPITAL MARKET

In the previous works the authors have presented – different than standard – approach to description and research of multivariate probability distributions. In this paper the obtained earlier new tools have been used for research and analysis of selected two-, three- and fourth-dimension random vectors of appearing on the Polish capital market. Coordinates of this vectors are stock market indices: WIG, WIG-20, WIG-Banks, WIG-Fuels and profitabilities of these indices. With the use of market data from the period between Jan the 4th 2016 to July the 7th 2017 the following estimators of parameters of analyzed distributions have been calculated and interpreted: *expected value*, *total variance*, *total standard deviation*, *skewness coefficient*, *norm of the skewness coefficient*, *square of the skewness coefficient*, *kurtosis* and *excess coefficient*. In order to overview and compare, for each vector there is *a covariance matrix* and *a matrix of correlation coefficients* indicated as well as commonly understood the following characteristics of marginal distributions: *expected value*, *variance*, *standard deviation*, *skewness coefficient*, *kurtosis* and *excess coefficient*. For selected pairs of financial random vectors that have been researched, estimator of the square of correlation coefficient has also been calculated, being one of the possible measures of their dependence.

Keywords: parameters of the probability distribution, multivariate random vector, estimator, capital market, stock index, profitability.