

Review on Doctoral thesis

Title: Verification on the Performance of Classical and Modern Portfolio Optimization Models

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Reviewer: Doc. RNDr. Ing. Miloš Kopa, Ph.D.

Description of the Doctoral Thesis Objectives

The main goal of the thesis is to study, analyse and verify out-of-sample performance of the optimal portfolios of classical and modern portfolio selection models comparing to that of the random choice. The author fully fulfilled the goal.

Structure of the doctoral thesis

The doctoral dissertation thesis consists of six chapters. After the Introduction, theoretical background and literature review of financial markets is summarized. Chapter 3 introduces various portfolio selection models and performance ratios (measures). It is followed by the description of the statistical testing of the portfolios' performance in Chapter 4. The next chapter presents the numerical results for three different cases. The thesis is concluded and summarized in the last chapter.

Comments and suggestions

1. In Chapter 4.3: The author generates uniformly the values from 4- or 16-dimensional simplex. Statistically speaking, she generates the random values from the so called Flat Dirichlet distribution. I am missing at least a little bit of information about this distribution and its properties. Especially, the information that the marginal distribution is so called Beta distribution with parameters (1,3) or (1,15), in general (1, $N-1$) where N is the dimension of the simplex, that is the number of assets.
2. Despite of the fact that the figure 4.5 is correct, I miss the comparison with the probability distribution function (density) of the appropriate Beta distribution which would immediately convince the reader that the results are correct. One can also accompany this figure by a statistical test of the zero hypothesis that the generated data are from the particular Beta distribution (goodness of fit test for Beta distribution).

Methodology, relevance and original contribution of the thesis

The author considered many different portfolio selection models and techniques which are quite widely used in the field. The most interesting part of the thesis, presenting the main original contributions consists of Chapters 4.3 – 4.5 (theoretical part) and Chapter 5 (empirical part). This is interesting from the practical point of view and contributes to the discussion about naïve vs. optimal portfolio strategies.

Formal and language style

The thesis is well written and I found only a few small mathematical, language or formal imperfections.

Publications

The number of publications is sufficient for sure, however, it is a pity that none of them was published in an IF journal.

Evaluation

The doctoral dissertation thesis presents original results, theoretical and empirical, some of them have already been published. It is well written with just a few imperfections. I have no doubts that the thesis fulfils the requirements. Therefore, **I recommend to accept the thesis** for the defense.

In Prague, 13.5.2022

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