Report on Bachelor / Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

Student: René Holešínský
Advisor: PhDr. František Čech, Ph.D.
Title of the thesis: Sector ETF Portfolio Optimization Using Differential Evolution

***OVERALL ASSESSMENT** (provided in English, Czech, or Slovak):*

Please provide your assessment of each of the following four categories, summary and suggested questions for the discussion. The minimum length of the report is 300 words.

In his thesis, René Holešínský studies the application of a differential evolution algorithm in portfolio optimization. Using the data on US sector-specific exchange traded funds, he tries to find a portfolio that would offer a better investment opportunity (in terms of risk and/or return) than the exchange traded fund that tracks the S&P 500 index, a naive portfolio that puts the same weight on all of the sectors and a global minimum variance portfolio. Portfolios with and without short positions are considered as well as three input data frequencies and three different rebalancing schemes. The results are mixed, but in general the tested method is considered quite successful, when compared to the benchmarks.

Contribution
The author studies an interesting approach to portfolio optimization and presents an original analysis that could be a good starting point for future research in this area.

Methods
The methods used are relevant to the research question. Although I would appreciate if they were introduced in more depth, it might be challenging, given the number of details that the author deals with. Though, in the last paragraph of p.22, I would be glad for a brief description of the last extension to the algorithm, as it seems quite crucial for the results analysis.

Literature
The literature is relevant and well used. I would appreciate a citation that supports the choice of p=0.2 (p.22, paragraph under eq.18).

Manuscript form
The thesis is well written and all the main results are nicely summarized in tables. I would only suggest to put all the methodology in one section. It could prevent duplicity and it could make the thesis easier to read. Next, I would reduce the number of footnotes, many of them could be included in the main text.

Summary and suggested questions for the discussion during the defense
Despite my suggestions above, I find the thesis interesting, well written and I believe that there is a lot to talk about during the defense. Not only about the mixed results and future research, but also about the methodology. For example about the choice of conditional value at risk as the risk measure and its estimation, or about the differential evolution algorithm extensions.

In my view, the thesis fulfills the requirements for a bachelor thesis at IES, Faculty of Social Sciences, Charles University, I recommend it for the defense and suggest a grade B.

(The results of the Urkund analysis do not indicate significant text similarity with other available sources.)

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

CATEGORY		POINTS
Contribution	*(max. 30 points)*	25
Methods	*(max. 30 points)*	26
Literature	*(max. 20 points)*	20
Manuscript Form	*(max. 20 points)*	16
TOTAL POINTS	*(max. 100 points)*	**87**
GRADE	**(A – B – C – D – E – F)**	**B**

NAME OF THE REFEREE: *Lucie Kraicová*

DATE OF EVALUATION: *30.08.2020*

Digitally signed (30.08.2020)
Lucie Kraicová

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Referee Signature

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EXPLANATION OF CATEGORIES AND SCALE:

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Overall grading:

TOTAL	GRADE
91 – 100	**A**
81 - 90	**B**
71 - 80	**C**
61 – 70	**D**
51 – 60	**E**
0 – 50	**F**