

# Opponent's Report on Dissertation Thesis

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

*Author:* Ing. Anlan Wang

*Supervisor:* doc. Ing. Aleš Kresta, Ph.D.

## 1. *Goals, topicality of the issue, scientific contribution and originality*

The dissertation thesis investigates traditional Markowitz approach to portfolio optimization and propose statistical technics identifying weights of assets in "strategy portfolio". The author provides several contributions to the recent literature.

First, she provides deep insights into the discussion about the future returns' probability distribution. Especially, in cases of normality rejection.

Second, the author provides several verification on real data. However, this part of the thesis weakly related to the theoretical background and economic intuition.

The main objective of the thesis is "to make the verification on the historical performance of strategy portfolios obtained by applying the classical and modern portfolio optimization models" and "to make the verification, we compare the performance of the strategy portfolios with that of the random-weights portfolios". Finally, the comparison of portfolio performance and random investments provides empirical results for the conclusions.

The issue is well introduced and explained in the beginning of the thesis, even the aim of the thesis is rather unfocused. It does not reflect the recent literature very well, especially changing conditions and asymmetries arising at the markets. Moreover, hypotheses should be better developed and explicitly defined.

## 2. *Theoretical background*

The author cites about 60 research papers in well-established journals. However, some parts of the thesis are very unfocused. The author describes basics of financial markets without reasonable relation to the thesis aims and employed optimization techniques. I would state that nearly 20 pages could be dropped without any significant impact on the contribution and the results.

On the contrary, specific events, especially Global Financial Crisis and COVID Pandemic are superficially described. The theoretical explanation of market implications is missing, the theoretical (economic) intuition is very weak.

The other parts of the literature review are well developed, especially Markowitz Modern Portfolio Theory approach.

### *3. Empirical strategy and results*

The empirical evidence is divided into three main parts. First, the author applies minimum-risk variance portfolio measures in the out-of-sample period, second, she focuses on minimum-CVaR strategies emphasizing asymmetric effects of the uptrend and the downtrend. Finally, third, she verifies portfolio performance optimization employing maximum-performance strategy. In the empirical strategy, the author contributes to the discussion related

The empirical evidence is based on daily data of the DJIA index in the period 2006–2021. She put specific emphasize on Global Financial Crisis (2007–2009) and COVID-19 Pandemic.

The results are well presented and interpreted. However, the statistical/technical interpretation prevails. There are still few questions remaining unanswered (see at the end of my report).

### *4. Formal requirements, structure of the thesis*

The thesis is very well structured (6 chapters), the text is readable. The main results are presented in the chapter 5. This chapter (23 pages) presents the main results of performance measures, optimization and three different verifications.

The thesis is fully in accordance with formal requirements, the language used is appropriate and consistent with international scientific standards. The author cites the literature correctly in the text as well as in the reference lists. The reference list contains sufficient number of entries ranging from renowned academic journals. This confirms that the author is familiar with up-to-date literature and able to work on the high-level research tasks in the field.

### *5. Final statement*

Summarily, the thesis presented by Anlan Wang is well motivated and highly relevant to the portfolio management. She also convincingly proved his ability to conduct competitive research in the area of asset pricing and portfolio optimization employing modern econometric techniques and appropriate theoretical background.

**Therefore I recommend this thesis for presentation and defense to award the philosophiæ doctor degree.**

**There are only few questions I would like to ask:**

**- what is the theoretical explanation of the asymmetries arising at the markets? It is theoretically described on page 53, but the economic intuition is too short.**

**- how the proposed methods are related to these asymmetries?**

**- what are the main “theoretical” differences between the Global Financial Crisis and COVID-19 Pandemic (with respect to asset pricing and optimization methods) resulting from the thesis?**

In Brno, May 18, 2022

Svatopluk Kapounek  
Associated Professor at Department of Finance  
Faculty of Business and Economics, Mendel University in Brno  
Zemedelska 1, 613 00 Brno, Czech Republic  
e-mail: kapounek@mendelu.cz