

Report on Bachelor Thesis

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

Student:	František Vlach
Advisor:	Luboš Hanus
Title of the thesis:	Comparison of GARCH models forecasting performance with respect to Value at risk

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

Short summary

The thesis addresses the topic of realised volatility with a particular focus on its application to the calculation of Value-at-Risk. The author provides a forecasting exercise utilising realised volatility data with the objective to model and forecast stock index volatilities. This approach is then compared to the traditional GARCH model. The significance of the comparison between models is statistically tested, for example, using the Diebold-Mariano test to assess the accuracy of the Value-at-Risk calculation.

Albeit, the thesis contains a lot of information and describes models in question, the text and the economic story does not feel coherent and reading it is moreless a „bumpy ride“.

Contribution

The principal contribution of the thesis is that the author employs methods that are not taught at the bachelor level, thereby enhancing his knowledge beyond the scope of the standard curriculum. In addition, the student's contribution is evident in the forecasting exercise, which employs a newly updated dataset. Readers may therefore ascertain which of the presented models could be selected for the 76 most traded stocks of SP500, with respect to value-at-risk.

Methods

As stated above, the student is using methods that are more advanced than the bachelor curriculum offered at the IES. However, the methods are advanced, the caveat is that the author's presentation and description does not show him to be strong in their understanding and this gives him a space in the defence to show otherwise.

The comparative exercise and test are well reported and provide the information. The tests are provided to answer the hypothesis and statistical significance.

Literature

The author draws upon pertinent literature to the time series in order to test the hypotheses proposed in the thesis. It is regrettable that the author frequently employs entire sentences from various sources without adequately citing them as valid quotations or, alternatively, without citing them at all, despite their high resemblance to the original texts.

Manuscript form

The manuscript is of an acceptable standard overall. Nevertheless, the text would benefit from further attention and refinement. The flow of the narrative and the methodology are frequently intricate, necessitating a reader to repeatedly reorient themselves to the author's intended message or its relationship to the analytical framework.

The author correctly references all tables and figures. In some instances, such as in Figure 3.3, the description could have been enhanced. The text contains a number of typos, such as the omission of the subscript "t" in the equation for the AR(1) model in Section 3.2.

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Overall evaluation and suggested questions for the discussion during the defense

First of all, as the supervisor, I can see the progress the author has made through the process of writing and carrying out the analysis. Unfortunately, the thesis has obvious shortcomings due to a probable haste or limited time spent during the writing process. Furthermore, I am not in a pleasant position to find that the thesis contains many textual similarities or incorrect citations, whatever the reason.

To summarise, in my view, the thesis does fulfill the requirements for a bachelor thesis at IES, Faculty of Social Science, Charles University. And if the student can defend the thesis and answer to the problems raised, I recommend it for the defense and suggest a grade D.

The results of the Turnitin analysis show a significant amount (42%) of text similar to other available sources. However, while I consider this amount to be significant, it is unlikely to be plagiarism per se, as only a few full sentences are likely to be "copy pasted". It is up to the author to explain the reason for this.

Q1: According to the results, why do you think that the HAR model is not one of the preferred models, even though its performance is praised in the literature?

Q2: What can you say about differences in stock prices, volatility, data when doing the analysis? We observe boxplot results in the study, which includes outliers. Do you know which assets are these?

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

CATEGORY	POINTS
<i>Contribution</i> (max. 30 points)	18
<i>Methods</i> (max. 30 points)	24
<i>Literature</i> (max. 20 points)	13
<i>Manuscript Form</i> (max. 20 points)	12
TOTAL POINTS (max. 100 points)	67
GRADE (A – B – C – D – E – F)	D

NAME OF THE REFEREE: *Luboš Hanus*

DATE OF EVALUATION: *August 27, 2024*

Digitally signed (27/8/2024)
Luboš Hanus

Referee Signature

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