Report on **Master Thesis**

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

Student:	**Tony Sako**
Advisor:	**doc. PhDr. Jozef Barunik Ph.D.**
Title of the thesis:	**Good volatility, bad volatility, and the cross-section of stock returns at different investment horizons**

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.

Contribution

The thesis works with an assumption that various investors in stock markets have different investment preferences revealed in the time frames of their investment decisions. Using frequency domain techniques, the thesis tries to uncover this type of behavior in data, and fits well into growing frequency domain literature looking at various aspects of asset pricing. Specifically, there are two main goals to be addressed: first to forecast horizon-specific volatility, and second to document how the horizon-specific volatility is priced as a risk factor in stock returns. With this respect I find the thesis innovative, and contributive since it contains original ideas, work, as well as results.

Methods

Several advanced methodologies are used in the thesis. Tony uses high frequency data to construct measures of volatility, wavelet transform to describe the investment horizons on data, then traditional HAR models to forcsast volatility at different horizons, and finally standard pricing regressions to see how the risk is priced. While these are all advanced methodologies, and the analysis is done rigorously enough, I find the methodology bit unorganized as it is not clear to me what is the main hypothesis to be addressed. Asset pricing theory is mixed with forecasting models, and is not properly introduced. Still, the methods used are sound.

Literature

Tony demonstrated his general understanding of the literature and linked his study to most of the important as well as relevant studies. He works with relevant literature properly, although using several strands of the literature from asset pricing, high frequency data, frequency econometrics, asymmetries etc. it is hard to see the main "take-away" from this survey. In addition, it is difficult to combine the several literatures to see how the thesis contributes. Finally, the main literature thesis is focusing on is to explain cross-section of returns. There is immense literature, and number of important results and concepts which should be mentioned, but section 2.3. very shortly summarizes instead.

Manuscript form

The text is logical, well written, connects findings to the existing literature well. Tony worked consistently to obtain the results for a long period, and we have discussed the results. As for the form of manuscript, it could be further improved and feels like a draft version rather then final form. Since the text is using many different methodologies, it is hard for a reader to understand what is the link, what is the main issue the thesis is trying to look at, etc. Hence the manuscript form is on a good level.

Summary and suggested questions for the discussion during the defense

In conclusion, I believe that during the work Tony proved himself to be an independent researcher, obtained interesting original results, and mastered advanced techniques. The thesis deserves to be defended. Whereas the thesis contains original results, and ideas, I also came across few problems which are not clear to me, and Tony should be able to address and clarify these points during the defence:

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1/ One of the main results is that extreme aggregate volatility (tail risk) is priced but regular volatility is not. However, I fail to find the support in results. Thesis breaks down the volatility to several investment horizons, but how do we get to tails, or extreme aggregate volatility?

2/ Another main result is that volatility is forecastable better at longer horizons. This is very interesting result, but I am not sure about testing methodology. If I understand correctly, the HAR model is fitted on different scales separately, and then errors are compared. But the problem is that we can not compare error from HAR forecast of short and long run volatility, since these two are statistically different time series. To make it comparable, we would need to have a model forecasting overall volatility with scale 1, and then second model forecasting overall volatility with scale 2. Now if model 2 produces smaller error that means that volatility can be forecasted with long run part better. Or, we can set up model decomposing volatility into horizons, and compare beta estimates and their importance, etc. But comparing several models on different scales is not statistically feasible in my opinion.

3/ Generally, I would expect a good presentation of the main motivation and hypothesis tested. Since the thesis contains lots of different results and material, I miss main economic contribution, and findings. Why should we believe that investors price stocks in a different way in long run in comparison to short run? (Can the results be connected to asset pricing theory, consumption pricing models etc?)

4/ Finally, I miss results and discussion about asymmetry in pricing, which is very interesting and claimed to be one of the main "selling points" according to the title. But we never learn the main take-away.

In case Tony is confident in presenting the details of the work during the defence, I suggest to award the work with grade "C" without doubts.

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

CATEGORY		POINTS
Contribution	*(max. 30 points)*	30
Methods	*(max. 30 points)*	18
Literature	*(max. 20 points)*	13
Manuscript Form	*(max. 20 points)*	12
TOTAL POINTS	*(max. 100 points)*	**73**
GRADE	**(A – B – C – D – E – F)**	**C**

NAME OF THE REFEREE: Jozef Barunik

DATE OF EVALUATION: May 29, 2018

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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.*

Strong	*Average*	*Weak*
30	*15*	*0*

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.*

Strong	*Average*	*Weak*
30	*15*	*0*

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

Strong	*Average*	*Weak*
20	*10*	*0*

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.*

Strong	*Average*	*Weak*
20	*10*	*0*

Overall grading:

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