Philosophical Faculty Palacký University Olomouc

Department of Applied Economics

FINAL THESIS REVIEW

Thesis type: **Bachelor**

Student (name and surname): **Tomáš Novák**
Supervisor: **Mgr. et Mgr. Jan Stoklasa, Ph.D.**
The topic of the final thesis: **Algorithmic trading strategies focussed on currencies**

1. Difficulty of the thesis in:

Theoretical knowledge	**standard**	~~high~~
Input data and its elaboration	**standard**	~~high~~
Applied methods	~~standard~~	**high**

2. Evaluation of the thesis:

Criterion	Evaluation grade (acc. to SC UP)					
	A	**B**	**C**	**D**	**E**	**F**
Level of reaching the thesis goal(s)			x			
Logical construction of the thesis			x			
Student's work during the topic elaboration			x			
Amount of the student's own contribution in comparison to the amount of taken information		x				
Suitability of applied methods		x				
Work with resources including citations						x
Layout of the thesis (text, graphs, tables)					x	
Stylistic level, grammaticality					x	
Applicability of the thesis conclusions in practice				x		

3. Questions to answer during the defence (eventually remarks of the supervisor):
The thesis is written with the goal of investigation of the performance of the chosen algorithmic trading strategies on FOREX in mind. The implementation of the chosen methods and their "field testing" on a selected dataset in Excel is done, thus making the trading strategies (the chosen indicators) and the data fully accessible to the readers of the thesis. The Excel files with computations are attached on the CD.

Unfortunately, the goal of the thesis is not specified as a goal anywhere. The closest text to a goal specification can be found IMO on page 8: "*This thesis will implement the automated process of backtesting on much more available and publicly known program Microsoft Excel The strategies are going to be backtested on numerous types of indicators such as Stochastic oscillator, CMF indicator or ATR. The strategies are going to be backtested on time series of the length of one year. The performance of the chosen algorithmic trading strategies measured in Excel (in terms of total revenues/losses) will be compared in the respective time-period and overall and the buy and hold strategy will be used as a universal benchmark.*"

This goal seems to be met – the calculations in excel are available on the appended CD, their results are summarized in the thesis. There are some possible problems with the interpretability of the numerical results that I will comment on further.

The level of English is not the highest, there are numerous mistakes. Sometimes the text is difficult to follow due to this. Also the length of the thesis is slightly below the suggested length of 72 000 characters, but given the appended excel files with calculations, this is definitely not a problem.

The thesis provides a short overview of FOREX, algorithmic trading (this part could have been much more elaborated) and of the chosen indicators to be applied in practice in the second part of the thesis. The indicators are introduced in an understandable way, but their correspondence with the generation of buy/sell signals is not established until the chapter 6. This makes the thesis hard to follow. Also, the choice of the currency pairs is not justified (even though some possible reasons are at least indicated in the text), the choice of the indicators to be included in the theoretical part is not explained. The justification of the selection of the three indicators to be used in the calculations is missing completely.

The results of the actual analysis are presented in tables and via screenshots from excel. This is not a good choice, since the amount of the work the author had to do to get the results remains blurred and the excel files actually say more about the results and the author's understanding of the topic, than the text of the thesis. (At least for the practical part this is my impression.) If we focus on the summary tables, they do provide some measures of the performance of the chosen indicators. But the author points out that the number of buy signals does not match the number of sell signals sometimes. How can the results be interpreted then? It seems, that due to this the results (numerical) are biased!

The limitations, possibility of generalization of the results etc. are not sufficiently discussed.

Some other issues I have with the text:
- The author misuses decimal points and comas (this makes all the numbers rather confusing in the text! Note, that e.g. on page 44 the author uses decimal comas and decimal points! This is not acceptable in an English scientific text.
- The use of citations is not OK at all. They do not have the proper form, sometimes it is not apparent which parts of the text they are supposed to cover (and hence which part of the text is the author's contribution), also the list of references is not sorted properly. But at least the author does indicate what parts are cited and from where.
- The screens of the excel tables are barely legible. But they at least provide some impression about the contents of the CD.
- The plots on page 42 are missing the y axes, do not fit the page, the values within are illegible and it also seems that each of the plots corresponds with a different currency pair. Which is very confusing.

This being said, the author has managed to show the understanding of the basic concepts of algorithmic trading and managed to successfully (with some errors, though) implement the selected

strategies in Excel from scratch and interpret their results well. I am therefore convinced that the author should be given a chance to defend his thesis. If he manages to answer the following questions sufficiently, I am willing to improve my grading. In its present form, I cannot grade the thesis better than E.

I have the following questions for the defence:
1) What is the generalizability of the results? What have we learned about the investigated strategies and their performance?
2) How can you get more sell signals than buy signals suggested by a strategy (what is the reason of this state)? Can you explain a real life situation, where such a thing would be valid?
3) Is there a simple rule you could add to the excel files (algorithms) to avoid the uneven number of buy/sell signals, or at least to avoid having more sell than buy signals? If so, how does it look like? What would be the effect of its implementation in the calculations – would your findings change (i.e. would some of the strategies become non-profitable/profitable)?
4) On page 44 you claim that the EMA strategy has proven to be a working strategy, but it has not generated profit. In what sense is it considered to be working, then?

4. The thesis has gone through the STAG theses.cz anti-plagiarism control resulting in: **the thesis is not a case of plagiarism**.

5. The thesis **is** recommended for the defence.

6. Suggested classification grade: **E**

Place and date

Olomouc, 6.5. 2019

Signature of the supervisor