



FINAL THESIS REVIEW

Thesis type: **Bachelor**

Student (name and surname): **Martin Michálek**

Opponent: **Mgr. Tomáš Talášek**

The topic of the final thesis: **Algorithmic trading strategies focused on cryptocurrencies**

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			
Amount of 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 opponent):

The thesis focuses on algorithmic trading strategies in the context of cryptocurrencies. The main goal is to test several algorithmic strategies on historical data (backtesting) and compare the results with buy and hold strategy as a universal benchmark.

Although this is a revised version of the thesis, there are still some issues that make the thesis hard to read: 1) The English text lacks a proofreading (e.g. page 15: "In 2014 there a wave of new cryptocurrency has appeared,..."). 2) References are insufficient (e.g. on page 13 is mention Wei Dai in 1998, but there is no such publication in the references; on page 9 is cited Obstfeld, Taylor, 2014, but in the references is Taylor and Obstfeld 2004; some internet sources missing date; some

citations are followed by number in brackets which is clearly not a year – e.g. page 16: Milton Freedman (6). 3) some claims are presented without proper sources (e.g. last paragraph of the introduction; page 17: About half of all bitcoin transactions involve illegal transaction either directly or indirectly on the dark web), 4) author uses some terms that are not defined (e.g. on page 11 author uses terms such as “short a put option”, “short a call option”, “time of maturity” without proper explanation) 5) Tables have no captions, 6) thesis contains section 4.1.1 but no section 4.1.

In the theoretical part author starts with several definitions (three) and continues with sections about cryptocurrencies, financial market, algorithmic trading and finally chart indicators. Especially the cryptocurrency part deserves to be extended. Crucial terms as blockchain or mining are only briefly mentioned without proper and explanation. Also, several cryptocurrencies are randomly mentioned without proper description/comparison. Moreover, Litecoin is not described at all although it is examined in the thesis.

In section 5, some formulas are misleading (at least from mathematical point of view) and hard to read (e.g. what is variable t in SMA formula; for which period is the variable $Close$ selected in EMA_t formula?). But mainly, why did the author not unifies the notation of variables? It is a little confusing when for the close price are used variables C , C_t , $Close$ and $Close(prev, n)$.

In practical part the author proposes five different trading strategies based on the presented indicators and backtesting them on two pairs BTC/USD and LTC/USD. This backtesting is done on historical data and compared with Buy and hold strategy. Moreover the time period is divided into 4 series (unfortunately this was not thoroughly explained in the thesis). The results are extensively presented using tables. Author also enclosed Excel files where everything can be checked.

In conclusion, the results are interesting and especially the Excel files could be useful for students that are interested in algorithmic trading. The goal of thesis was therefore fulfilled. Unfortunately, there is almost no comparison of the results (with minor exception in the conclusion) which could improve the thesis significantly.

I have the following questions:

- 1) Is there any difference between Bitcoin and Litecoin? Also, in the text Bitcoin cash is mentioned – what is a difference between Bitcoin and Bitcoin cash?
- 2) On page 17 the terms dark web and deep web are mentioned. What do they mean?
- 3) On page 17 is stated “*About half of all bitcoin transactions involve illegal transaction either directly or indirectly on the dark web.*” – can you support this claim by a proper source?
- 4) How hard was to implement these trading strategies in Excel? What was the biggest issue?
- 5) Which from the strategies is the best one (based on the data in the thesis)? Would you decide to invest your money using this strategy?

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

5. Suggested classification grade: **E**

Place and date

Signature of the opponent