

Report on Bachelor Thesis

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

Student:	Jakub Doškář
Advisor:	Nicolas Fanta
Title of the thesis:	Examining the Interaction between the Cryptocurrency Market Development and Activity on Leading Social Networks

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

Short summary

The thesis tries to explore the idea that social media activity, especially sentiment value of Twitter posts can predict changes in cryptocurrency prices. The analysis is done using one hour and 15 minute frequency data during 02/2021-11/2001 time span. Author claims to find that variability in Bitcoin prices can be explained to some extent by sentiment as well as that sentiment serves as predictor of directional changes.

Contribution

The thesis aims to contribute to wide ongoing literature trying to understand the role of sentiment in cryptocurrency markets. While there are lots of studies, author explores specific dataset which makes the contribution empirical.

Methods

The author uses dictionary-based sentiment analysis using Valence Aware Dictionary for Sentiment Reasoning (VADER) dictionary and then using simple regressions as well as logistic regressions try to explain the closing prices as well as estimate the direction of price change with sentiment. Methods are appropriately chosen for the research question, although the regressions using prices are spurious and I could not see how the models were used for explaining predictive power (see my discussion below).

Literature

The text works with literature properly, discusses all relevant sources in sufficient detail.

Manuscript form

The text is bit difficult to read as it does not connect paragraphs and ideas well. This is also driven by often informal and imprecise use of language, frequent typos, and erroneous language syntax. Even more serious, the results are often not connected to Tables, and it is hard to see what Table author refers to. This makes it hard to understand the results.

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Overall evaluation and suggested questions for the discussion during the defense

I have few points for the defense that author should discuss:

1/ Is the sentiment measure good proxy for sentiment? Can author discuss to what extent the results might be driven by the choice of the sentiment measure?

2/ Fig1 shows that positive scores are much more common in the dataset. Can results be influenced by this?

3/ Results:

OLS results – you regress sent per tweet on closing price. These are not stationary, to what extent these can be spurious (look at constant and sent_per_tweet coefficients that are inverse with the same magnitude). If I wanted to estimate impact of change of sentiment on price variability, then I would use differences – returns equation. While there is Table 3 showing price change, but it is not described and discussed, I can guess this is the case and it confirms my suspicion, and the results show almost no power of sentiment. Hence the previous results are spurious.

How significant are the directional change prediction results? I cannot see any support for the claim that sentiment predicts future direction of the prices. In the text one can find 51-52 percent correctly predicted but no other metrics is used.

Can author confirm if he used lags of variables? I did not find any mention on that. So are regressions predictive? In addition, could sentiment predict future 2, 3, 4... hours? I believe author confused explanation and in-sample fit with out-of-sample I am afraid the results do not show prediction power.

„OLS model after optimisation“ - what does it mean? How can you optimize OLS?

Author mentions transformation of data results in loss of degrees of freedom, can you explain in more detail?

4/ What is the economic mechanism behind the studies interaction. In other words, why we should believe that Tweets will possess a sentiment value that will predict the direction in next 15 minutes, or 1 hour (that is it will influence market participants to act in a way to move the price)

In conclusion, the thesis attempts to find the link between sentiment inferred from Twitter, and cryptocurrency prices. While this is an interesting question, I believe it has not been explored well from several reasons. Least squares estimates reported show signs of spurious regressions that cannot be used for identification of such effects, in turn the results using returns (if I understand it correctly since this is not clear from the text) confirm no relation. Second, it is hard to justify choice of a single dictionary to be a good proxy of sentiment. Third, and most important I am not sure I see the value in looking at directional probability of price changes with respect to sentiment from the results. The analysis is merely descriptive, and it is hard to see the value from the tables.

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The results from Urkund do not indicate significant text similarity with other available sources. The thesis fulfills the requirements for a bachelor thesis at IES, FSV UK, and I recommend it for the defense and suggest a grade E.

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

CATEGORY	POINTS
<i>Contribution (max. 30 points)</i>	13
<i>Methods (max. 30 points)</i>	16
<i>Literature (max. 20 points)</i>	15
<i>Manuscript Form (max. 20 points)</i>	11
TOTAL POINTS (max. 100 points)	55
GRADE (A – B – C – D – E – F)	E

NAME OF THE REFEREE: Jozef Barunik

DATE OF EVALUATION: 10.1.2023

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