

Document details

< Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More... >

Full Text View at Publisher

Research in International Business and Finance
Volume 50, December 2019, Pages 306-321

Lead-Lag relationship between Bitcoin and Ethereum : Evidence from hourly and daily data (Article)

Sifat, I.M. Mohamad, A. Mohamed Shariff, M.S.B.

Department of Finance, Kulliyah of Economics and Management Sciences, International Islamic University Malaysia, Kuala Lumpur, 53100, Malaysia

Abstract

View references (54)

This paper investigates lead-lag relationship between heavyweight cryptocurrencies Bitcoin and Ethereum . Traditional studies of information flow between markets preponderate on cash vs. futures, whereby researchers are interested in the stabilizing impact of futures on spot markets. While interest in the same relationship in the nascent cryptocurrency sphere is emerging, little is known regarding price leadership between these assets. In this paper, we employ a battery of statistical tests—VECM, Granger Causality, ARMA, ARDL and Wavelet Coherence—to identify price leadership between the two crypto heavyweights Bitcoin and Ethereum . Based on one year hourly and daily data from August 2017 through to September 2018, our tests yield varied results but largely suggest bi-directional causality between the two assets. Moreover, the results indicate that intraday crypto traders can barely exploit Bitcoin - Ethereum hourly or daily price discovery process to their advantage. © 2019 Elsevier B.V.

SciVal Topic Prominence

Topic: Technology | Contracts | Public ledger

Prominence percentile: 99.945

Author keywords

Bitcoin Cryptocurrency Ethereum Lead-lag relationship Wavelet coherence

ISSN: 02755319
Source Type: Journal
Original language: English

DOI: 10.1016/j.ribaf.2019.06.012
Document Type: Article
Publisher: Elsevier Ltd

References (54)

View in search results format >

All Export Print E-mail Save to PDF Create bibliography

1 Aaltonen, A. Cryptocurrencies' Internal and External Relations (2017) Aalto University

Metrics



PlumX Metrics
Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >
Set citation feed >

Related documents

- Price discovery in emerging currency markets
Kumar, S. (2018) Research in International Business and Finance
- The lead-lag relationship between the spot and futures markets in China
Wang, D. , Tu, J. , Chang, X. (2017) Quantitative Finance
- An empirical examination of the lead-lag relationship between spot and futures markets: Evidence from Thailand
Judge, A. , Reancharoen, T. (2014) Pacific Basin Finance Journal

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

- ☐ 2 Abhyankar, A.H.
Return and volatility dynamics in the FT-SE 100 stock index and stock index futures markets

(1995) *Journal of Futures Markets*, 15 (4), pp. 457-488. Cited 78 times.
doi: 10.1002/fut.3990150405

[View at Publisher](#)

- ☐ 3 Abhyankar, A.
Linear and nonlinear Granger causality: Evidence from the U.K. stock index futures market

(1998) *Journal of Futures Markets*, 18 (5), pp. 519-540. Cited 51 times.
<http://www.interscience.wiley.com/jpages/0270-7314>
doi: 10.1002/(SICI)1096-9934(199808)18:5<519::AID-FUT2>3.0.CO;2-U

[View at Publisher](#)

- ☐ 4 Bartos, J.
Does Bitcoin follow the hypothesis of efficient market?
(2015) *Int. J. Econ. Sci. IV*, pp. 10-23. Cited 18 times.

- ☐ 5 Bohl, M.T., Salm, C.A., Schuppli, M.
Price discovery and investor structure in stock index futures

(2011) *Journal of Futures Markets*, 31 (3), pp. 282-306. Cited 53 times.
doi: 10.1002/fut.20469

[View at Publisher](#)

- ☐ 6 Bouri, E., Azzi, G., Dyhrberg, A.H.
On the return-volatility relationship in the bitcoin market around the price crash of 2013
([Open Access](#))

(2017) *Economics*, 11, art. no. 2017-2. Cited 33 times.
http://www.economics-ejournal.org/economics/journalarticles/2017-2/version_1/at_download/file
doi: 10.5018/economics-ejournal.ja.2017-2

[View at Publisher](#)

- ☐ 7 Brandvold, M., Molnár, P., Vagstad, K., Andreas Valstad, O.C.
Price discovery on Bitcoin exchanges
(2015) *Journal of International Financial Markets, Institutions and Money*, 36, pp. 18-35. Cited 50 times.
<http://www.elsevier.com/locate/intfin>
doi: 10.1016/j.intfin.2015.02.010

[View at Publisher](#)

- ☐ 8 Brauneis, A., Mestel, R.
Price discovery of cryptocurrencies: Bitcoin and beyond

(2018) *Economics Letters*, 165, pp. 58-61. Cited 40 times.
<http://www.elsevier.com/homepage/sae/econbase/econlet/>
doi: 10.1016/j.econlet.2018.02.001

[View at Publisher](#)

- ☐ 9 Brière, M., Oosterlinck, K., Szafarz, A.
Virtual currency, tangible return: Portfolio diversification with bitcoin

(2015) *Journal of Asset Management*, 16 (6), pp. 365-373. Cited 71 times.
<http://www.palgrave-journals.com/jam/index.html>
doi: 10.1057/jam.2015.5

[View at Publisher](#)

- ☐ 10 Brooks, C., Rew, A.G., Ritson, S.
A trading strategy based on the lead-lag relationship between the spot index and futures contract for the FTSE 100
(2001) *International Journal of Forecasting*, 17 (1), pp. 31-44. Cited 69 times.
doi: 10.1016/S0169-2070(00)00062-5
[View at Publisher](#)
-
- ☐ 11 Cabrera, J., Wang, T., Yang, J.
Do futures lead price discovery in electronic foreign exchange markets?
(2009) *Journal of Futures Markets*, 29 (2), pp. 137-156. Cited 42 times.
<http://www3.interscience.wiley.com/cgi-bin/fulltext/121548513/PDFSTART>
doi: 10.1002/fut.20352
[View at Publisher](#)
-
- ☐ 12 Chen, Y.-L., Gau, Y.-F.
Tick sizes and relative rates of price discovery in stock, futures, and options markets: Evidence from the Taiwan stock exchange
(2009) *Journal of Futures Markets*, 29 (1), pp. 74-93. Cited 23 times.
<http://www3.interscience.wiley.com/cgi-bin/fulltext/121533410/PDFSTART>
doi: 10.1002/fut.20319
[View at Publisher](#)
-
- ☐ 13 Christopoulos, D.K., Tsionas, E.G.
Financial development and economic growth: Evidence from panel unit root and cointegration tests
(2004) *Journal of Development Economics*, 73 (1), pp. 55-74. Cited 310 times.
<http://www.elsevier.com/inca/publications/store/5/0/5/5/4/6/index.htm>
doi: 10.1016/j.jdeveco.2003.03.002
[View at Publisher](#)
-
- ☐ 14 Ciaian, P., Rajcaniova, M., Kancs, D.
Virtual relationships: Short- and long-run evidence from BitCoin and altcoin markets ([Open Access](#))
(2018) *Journal of International Financial Markets, Institutions and Money*, 52, pp. 173-195. Cited 40 times.
<http://www.elsevier.com/locate/intfin>
doi: 10.1016/j.intfin.2017.11.001
[View at Publisher](#)
-
- ☐ 15 Corbet, S., Meegan, A., Larkin, C., Lucey, B., Yarovaya, L.
Exploring the dynamic relationships between cryptocurrencies and other financial assets
(2018) *Economics Letters*, 165, pp. 28-34. Cited 86 times.
<http://www.elsevier.com/homepage/sae/econbase/econlet/>
doi: 10.1016/j.econlet.2018.01.004
[View at Publisher](#)
-
- ☐ 16 Corelli, A.
Cryptocurrencies and exchange rates: A relationship and causality analysis ([Open Access](#))
(2018) *Risks*, 6 (4), art. no. 111. Cited 2 times.
www.mdpi.com/journal/risks/
doi: 10.3390/risks6040111
[View at Publisher](#)
-

- ☐ 17 Dyhrberg, A.H.
Hedging capabilities of bitcoin. Is it the virtual gold?
(2016) *Finance Research Letters*, 16, pp. 139-144. Cited 105 times.
<http://www.elsevier.com/inca/publications/store/6/7/2/9/0/8/index.htm>
doi: 10.1016/j.frl.2015.10.025
[View at Publisher](#)
-
- ☐ 18 Dyhrberg, A.H.
Bitcoin, gold and the dollar - A GARCH volatility analysis
(2016) *Finance Research Letters*, 16, pp. 85-92. Cited 140 times.
<http://www.elsevier.com/inca/publications/store/6/7/2/9/0/8/index.htm>
doi: 10.1016/j.frl.2015.10.008
[View at Publisher](#)
-
- ☐ 19 Eross, A., McGroarty, F., Urquhart, A., Wolfe, S.
The intraday dynamics of bitcoin
(2017) *SSRN Electron. J.*
-
- ☐ 20 Fama, E.F.
Market efficiency, long-term returns, and behavioral finance
(1998) *Journal of Financial Economics*, 49 (3), pp. 283-306. Cited 1733 times.
-
- ☐ 21 Frino, A., Walter, T., West, A.
The lead-lag relationship between equities and stock index futures markets around information releases
(2000) *Journal of Futures Markets*, 20 (5), pp. 467-487. Cited 39 times.
<http://www.interscience.wiley.com/jpages/0270-7314>
doi: 10.1002/(SICI)1096-9934(200005)20:5<467::AID-FUT4>3.0.CO;2-L
[View at Publisher](#)
-
- ☐ 22 Gandal, N., Halaburda, H.
Competition in the Cryptocurrency Market. Unpublished Manuscript
(2014) . Cited 25 times.
Bank of Canada [WWW Document]. URL (accessed 6.6.18)
<https://www.bankofcanada.ca/wp-content/uploads/2014/08/wp2014-33.pdf>
-
- ☐ 23 Gao, R.X., Yan, R.
Wavelets: Theory and applications for manufacturing
(2011) *Wavelets: Theory and Applications for Manufacturing*, pp. 1-224. Cited 161 times.
<http://www.springerlink.com/openurl.asp?genre=book&isbn=978-1-4419-1544-3>
ISBN: 978-144191544-3
doi: 10.1007/978-1-4419-1545-0
[View at Publisher](#)
-
- ☐ 24 Gwilym, O.A., Buckle, M.
The lead-lag relationship between the FTSE100 stock index and its derivative contracts
(2001) *Appl. Financ. Econ.*, 11 (4), pp. 385-393. Cited 26 times.
-

- ☐ 25 Haferkorn, M., Diaz, J.M.Q.
Seasonality and interconnectivity within cryptocurrencies - An analysis on the basis of bitcoin, litecoin and namecoin
(2015) *Lecture Notes in Business Information Processing*, 217, pp. 106-120. Cited 8 times.
<http://www.springer.com/series/7911>
ISBN: 978-331928150-6
doi: 10.1007/978-3-319-28151-3_8
[View at Publisher](#)
-
- ☐ 26 Hagemann, D.
A Time Series Analysis of Crypto Currency Price Data
(2018)
-
- ☐ 27 Halaburda, H., Gandal, N.
Competition in the cryptocurrency Market
(2014) *SSRN Electron. J.*. Cited 25 times.
-
- ☐ 28 Hayes, A.S.
Cryptocurrency value formation: An empirical study leading to a cost of production model for valuing bitcoin
(2017) *Telematics and Informatics*, 34 (7), pp. 1308-1321. Cited 40 times.
doi: 10.1016/j.tele.2016.05.005
[View at Publisher](#)
-
- ☐ 29 Herron, Z.
Information and Volatility Dynamics in the Bitcoin Futures Market. Unpublished Manuscript
(2018)
Northwestern University Illinois [WWW Document]. URL (accessed 6.6.18)
http://mmss.wcas.northwestern.edu/thesis/articles/get/976/herronzachary_46692_5386360_Final_Thesis_Herron.pdf
-
- ☐ 30 Iihara, Y., Kato, K., Tokunaga, T.
Intraday return dynamics between the cash and the futures markets in Japan
(1996) *Journal of Futures Markets*, 16 (2), pp. 147-162. Cited 47 times.
<http://www.interscience.wiley.com/jpages/0270-7314>
doi: 10.1002/(SICI)1096-9934(199604)16:2<147::AID-FUT2>3.0.CO;2-K
[View at Publisher](#)
-
- ☐ 31 Judge, A., Reanchaen, T.
An empirical examination of the lead-lag relationship between spot and futures markets: Evidence from Thailand
(2014) *Pacific Basin Finance Journal*, 29, pp. 335-358. Cited 16 times.
<http://www.elsevier.com/locate/pacfin>
doi: 10.1016/j.pacfin.2014.05.003
[View at Publisher](#)
-
- ☐ 32 Kang, J., Lee, C.J., Lee, S.
An Empirical Investigation of the Lead-Lag Relations of Returns and Volatilities among the KOSPI200 Spot, Futures and Options Markets and their Explanations
(2006) *Journal of Emerging Market Finance*, 5 (3), pp. 235-261. Cited 19 times.
doi: 10.1177/097265270600500303
[View at Publisher](#)
-

-
- ☐ 33 Kavussanos, M.G., Nomikos, N.K.
Price discovery, causality and forecasting in the freight futures market
(2003) *Review of Derivatives Research*, 6 (3), pp. 203-230. Cited 51 times.
doi: 10.1023/B:REDR.0000004824.99648.73
[View at Publisher](#)
-
- ☐ 34 Kim, Y.B., Kim, J.G., Kim, W., Im, J.H., Kim, T.H., Kang, S.J., Kim, C.H.
Predicting fluctuations in cryptocurrency transactions based on user comments and replies
([Open Access](#))
(2016) *PLoS ONE*, 11 (8), art. no. e0161197. Cited 40 times.
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161197>
doi: 10.1371/journal.pone.0161197
[View at Publisher](#)
-
- ☐ 35 Lamon, C., Nielsen, E., Redondo, E.
Cryptocurrency Price Prediction Using News and Social Media Sentiment [WWW Document]
(2016) . Cited 5 times.
URL (accessed 6.6.18)
<https://pdfs.semanticscholar.org/c3b8/0de058596cee95beb20a2d087dbcf8be01ea.pdf>
-
- ☐ 36 Li, X., Wang, C.A.
The technology and economic determinants of cryptocurrency exchange rates: The case of Bitcoin
(2017) *Decision Support Systems*, 95, pp. 49-60. Cited 54 times.
doi: 10.1016/j.dss.2016.12.001
[View at Publisher](#)
-
- ☐ 37 Mai, F., Bai, Q., Shan, Z., Wang, X.S., Chiang, R.
The Impacts of Social Media on Bitcoin Performance. Unpublished Manuscript
(2016) . Cited 3 times.
University of Cincinnati Ohio [WWW Document]. URL (accessed 6.6.18)
http://www.fmaconferences.org/Orlando/Papers/Bitcoin_FMA.pdf
-
- ☐ 38 Masiak, C., Block, J.H., Masiak, T., Neuenkirch, M., Pielen, K.
The triangle of ICOs, bitcoin and ethereum: a time series analysis
(2018) *SSRN Electron. J.*
-
- ☐ 39 Matta, M., Lunesu, I., Marchesi, M.
Bitcoin Spread Prediction Using Social And Web Search Media, UMAP Workshops
(2015)
-
- ☐ 40 Nadarajah, S., Chu, J.
On the inefficiency of Bitcoin
(2017) *Economics Letters*, 150, pp. 6-9. Cited 109 times.
<http://www.elsevier.com/homepage/sae/econbase/econlet/>
doi: 10.1016/j.econlet.2016.10.033
[View at Publisher](#)
-
- ☐ 41 Newbold, Paul
PRINCIPLES OF THE BOX-JENKINS APPROACH.
(1975) *Operational Research Quarterly*, 26 (2 ii), pp. 397-412. Cited 11 times.
-

-
- 42 Petrov, V., Golub, A., Olsen, R.B.
Instantaneous volatility seasonality of bitcoin in directional-change intrinsic time
(2018) *SSRN Electron. J.*
-
- 43 Pizzi, M.A., Economopoulos, A.J., O'Neill, H.M.
An examination of the relationship between stock index cash and futures markets: A cointegration approach

(1998) *Journal of Futures Markets*, 18 (3), pp. 297-305. Cited 60 times.
<http://www.interscience.wiley.com/jpages/0270-7314>
doi: 10.1002/(SICI)1096-9934(199805)18:3<297::AID-FUT4>3.0.CO;2-3

View at Publisher
-
- 44 Roope, M., Zurbrugg, R.
The Intra-day Price Discovery Process between the Singapore Exchange and Taiwan Futures Exchange

(2002) *Journal of Futures Markets*, 22 (3), pp. 219-240. Cited 46 times.
doi: 10.1002/fut.2215

View at Publisher
-
- 45 So, R.W., Tse, Y.
Price discovery in the Hang Seng Index markets: Index, futures, and the tracker fund

(2004) *Journal of Futures Markets*, 24 (9), pp. 887-907. Cited 68 times.
doi: 10.1002/fut.20112

View at Publisher
-
- 46 Sovbetov, Y.
Factors influencing cryptocurrency prices: evidence from Bitcoin, ethereum, dash, Litecoin, and monero journal of economics and financial analysis
(2018) *J. Econ. Financ. Anal. Sovbetov / JEFA*, 2, pp. 1-27. Cited 10 times.
-
- 47 Stoll, H.R., Whaley, R.E.
The Dynamics of Stock Index And Stock Index Futures Returns

(1990) *Journal of Financial and Quantitative Analysis*, 25 (4), pp. 441-468. Cited 415 times.
doi: 10.2307/2331010

View at Publisher
-
- 48 Streche, L.
Lead-Lag Relationship Between the Romanian Cash Market and Futures Market. Unpublished Manuscript
(2009) . Cited 4 times.
[WWW Document]. URL Bucharest University of Economics Bucharest
<http://www.dofin.ase.ro/Working%20papers/Streche%20Lucian/streche.lucian.dissertation.pdf>
-
- 49 Tse, Y.K.
Lead-lag relationship between spot index and futures price of the nikkei stock average

(1995) *Journal of Forecasting*, 14 (7), pp. 553-563. Cited 55 times.
doi: 10.1002/for.3980140702

View at Publisher
-

□ 50 Urquhart, A.
The volatility of bitcoin
(2017) *SSRN*

□ 51 Urquhart, A.
Price clustering in Bitcoin

(2017) *Economics Letters*, 159, pp. 145-148. Cited 65 times.
<http://www.elsevier.com/homepage/sae/econbase/ecolet/>
doi: 10.1016/j.econlet.2017.07.035

[View at Publisher](#)

□ 52 Urquhart, A.
The inefficiency of Bitcoin

(2016) *Economics Letters*, 148, pp. 80-82. Cited 173 times.
<http://www.elsevier.com/homepage/sae/econbase/ecolet/>
doi: 10.1016/j.econlet.2016.09.019

[View at Publisher](#)

□ 53 Wahab, M., Lashgari, M.
Price dynamics and error correction in stock index and stock index futures markets: A cointegration approach

(1993) *Journal of Futures Markets*, 13 (7), pp. 711-742. Cited 120 times.
doi: 10.1002/fut.3990130702

[View at Publisher](#)

□ 54 Yang, J., Yang, Z., Zhou, Y.
Intraday price discovery and volatility transmission in stock index and stock index futures markets: Evidence from China

(2012) *Journal of Futures Markets*, 32 (2), pp. 99-121. Cited 84 times.
doi: 10.1002/fut.20514

[View at Publisher](#)

🔍 Mohamad, A.; Department of Finance, Kulliyah of Economics and Management Sciences, International Islamic University Malaysia, Kuala Lumpur, Malaysia; email:m.azhar@iiu.edu.my
© Copyright 2019 Elsevier B.V., All rights reserved.

< Back to results | 1 of 1

^ Top of page

About Scopus

What is Scopus
Content coverage
Scopus blog
Scopus API
Privacy matters

Language

日本語に切り替える
切换到简体中文
切换到繁體中文
Русский язык

Customer Service

Help
Contact us

ELSEVIER

[Terms and conditions](#) [Privacy policy](#)

Copyright © Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies.

RELX

