Applied Economics ›

Volume 49, 2017 - Issue 50

Original Articles

Bitcoin for energy commodities before and after the December 2013 crash: diversifier, hedge or safe haven?

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Pages 5063-5073 | Published online: 07 Mar 2017

Cite this article https://doi.org/10.1080/00036846.2017.1299102

ABSTRACT

We study the relationship between Bitcoin and commodities by assessing the ability of Bitcoin to act as a diversifier, hedge, or safe haven against daily movements in commodities in general, and energy commodities in particular. We focus on energy commodities because energy, in the form of electricity, is an essential input in the Bitcoin production. For the entire period, results show that Bitcoin is a strong hedge and a safe-haven against movements in both commodity indices. We further examine whether that ability is also present for non-energy commodities and our analysis show insignificant results when energy commodities are excluded from the general commodity index. We also account for the December 2013 Bitcoin price crash and our results reveal that Bitcoin hedge and safe-haven properties against commodities and energy commodities are only present in the pre-crash period, whereas in the post-crash

period Bitcoin is no more than a diversifier. In addition to uncovering the time-varying role of Bitcoin, we highlight the dissimilarity in the dynamic correlations between the extreme downward and extreme upward movements.

KEYWORDS:

Cryptocurrency | Bitcoin crash | commodities | energy commodities | diversifier | hedge | safe haven

JEL CLASSIFICATION:

C1 | G1 | Q4

Highlights

- We uncover the time-varying diversification ability of Bitcoin
- Bitcoin is a strong hedge and safe haven for energy commodities, but not for non-energy commodities.
- The price crash of 2013 affects the relation between Bitcoin and energy commodities
- Dynamic correlations between the extreme downward and upward movements are dissimilar

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

[1] For detailed information on the principles of Bitcoin, the reader can refer to Segendorf (2014) and Dwyer (2015).

[2] Other digital currencies include, among others, Ethereum, Ripple, and Litecoin. Each of these three currencies has a market capitalization in excess of 100 million US dollars.

[3] That energy expenditure secures Bitcoin from attacks by speculators or criminals: it is required to increase security for the network by solving series of cryptographic puzzles, hereby raising the computer power needed to attempt to gain control of Bitcoins transactions on the network.

[4] Computer cooling firm Allied Control estimates the power consumption per Bitcoin transaction to be equivalent to around 1.6 times the daily usage of electricity of an average US household. Thus, a Bitcoin transaction requires 5,000 times more energy than, for instance, a VISA transaction.

[5] We thank the referee for mentioning this important point.

[6] Several studies so far find very weak relation between Bitcoin and conventional assets (e.g. Baur, Lee, and Hong 2015), suggesting that Bitcoin is a useful diversifier.

[7] For further discussion of Bitcoin price determinants, readers can refer to Kristoufek (2015) and Ciaian, Rajcaniova, and Kancs (2016).

[8] This is confirmed also empirically by Hayes (2016), who estimates that at the time of his calculation, the marginal cost of mining one Bitcoin was $415, whereas the Bitcoin price was $420.

[9] For a detailed explanation on the ADCC model and its estimation, the reader can refer to Cappiello, Engle, and Sheppard (2006).