The Viability of Cryptocurrency

Blockchain Boys
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Introduction

Cryptocurrency is a digital, decentralized currency built with cryptographic protocols that make transactions secure and difficult to fake using blockchains. With its technological and high value appeal to investors, cryptocurrency begs the question: what is the viability of cryptocurrency based on risk over a period of time?

Compared to the US Dollar Index, the weighted average of the foreign exchange value of the U.S. dollar against the currencies of major U.S. trading partners, three cryptocurrencies were chosen for historical data observation and analysis: Bitcoin (BTC), a peer-to-peer electronic cash system (top market cap), Ethereum (ETH), an open source platform/crypto for decentralized applications, and Dogecoin (DOGE), an outlying & extremely low-value "meme" cryptocurrency.

Methodology

Calculating Risk

Using historical data sets and MATLAB to create curves of lines of best fit, risk is calculated by determining the second derivative of each function per interval and cryptocurrency.

Splitting the Data

Due to mainstream attention during early 2017 and late 2018, cryptocurrency experienced a crash in value after an unprecedented boom and sell-off. This is used as a reference point, splitting the data sets within three intervals: pre-crash, post-crash, and current.

Comparison

In order to determine the viability of the chosen cryptocurrencies, each coin had its risk (second derivative) individually compared to that of the USD Index, measuring the quantitative value and nature of crypto against a global currency measure.

Results

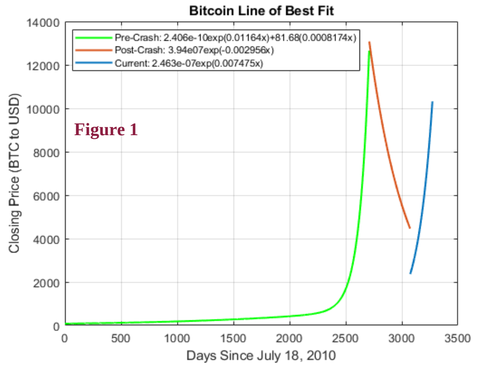

Figure 1

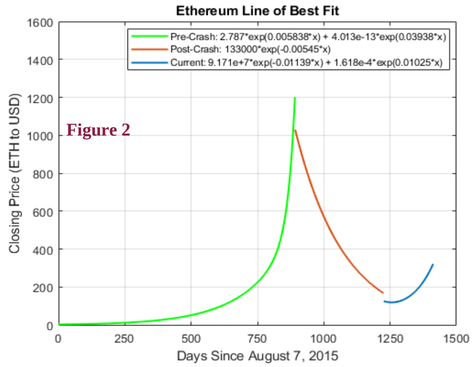

Figure 2

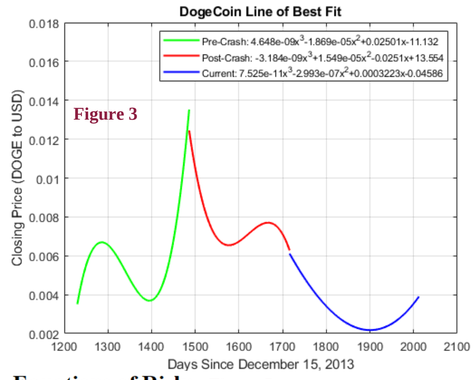

Figure 3

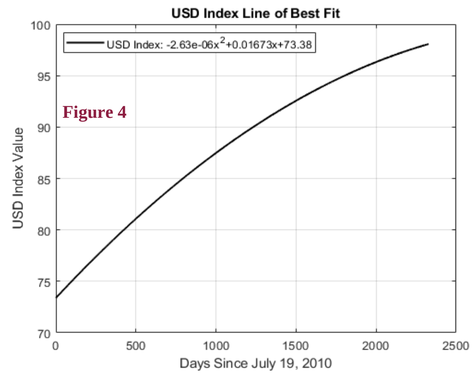

Figure 4

Equations of Risk: Figure 5

BTC Pre-Crash: $\left|0.0000002463 \cdot (0.007475^2) \cdot e^{0.007475x}\right|$

BTC Post-Crash: $\left|39400000 \cdot (-0.0029562^2) \cdot e^{-0.002956x}\right|$

BTC Current: $\left|0.0000000002406 \cdot (0.01164^2) \cdot e^{0.01164x} + 81.68 \cdot (0.0008174^2) \cdot e^{0.0008174x}\right|$

ETH Pre-Crash: $\left|2.787 \cdot (0.005838^2) \cdot e^{0.005838x} + 4.013 \cdot (10\hat{}-13) \cdot (0.03938^2) \cdot e^{0.03938x}\right|$

ETH Post-Crash: $\left|133000 \cdot (0.00545^2) \cdot e^{-0.00545x}\right|$

ETH Current: $\left|91710000 \cdot (-0.01139^2) \cdot e^{-0.01139x} + 0.0001618 \cdot (0.01025^2) \cdot e^{0.01025x}\right|$

DOGE Pre-Crash: $|0.000000027888x - 0.00003738|$

DOGE Post-Crash: $|-0.000000019104x + 0.00003098|$

DOGE Current: $|0.0000000004515x - 0.0000005986|$

Conclusion & Discussion

Cryptocurrency, in its current state, is not viable in terms of risk. In the calculation of risk for each crypto (Figure 5), it is found that BTC and ETH do not consistently maintain values close enough to zero across the intervals. This presents a greater instability and lack of value safety (Figures 1-2), incomparable to the DXY risk (Figure 4), especially in a growing economy and circulating foreign exchange market. Although the equations of DOGE maintain a lower risk than the DXY, its extremely low coin value, $0.003306 as of 7/10, indicate its inability to grow and increase circulation. Although the technology and fundamental concept of cryptocurrency is promising, vulnerabilities in blockchain and presented risk values of the three chosen cryptos fail to be stable enough to be used in the same manner as physical currency and maintain widespread use among consumers. The inherent current utility of cryptocurrency as an investment option exposes its gambling nature, similar to that of a stock market.

Future Works

Analyzing accountability of factors of cryptocurrency volatility, machine-learning algorithms are created to predict value of given cryptocurrency. Using artificial intelligence and neural networks, programs are developed to automate crypto trading and stabilize value over time.

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