**Analysis of Cryptocurrency Relationships**

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Cryptocurrencies have been a major topic in online communities due to the volatile nature of the prices and the opportunity to make a significant amount of money. Being able to correlate the value of a cheaper cryptocurrency to a larger one could help predict the future value of the cheaper coin. Bitcoin is the largest and most valuable cryptocurrency currently available. It has been a major driver in the crypto market and could have the potential to affect the value of other cryptocurrencies. Dogecoin, which is commonly referred to as a “meme-coin”, gained significant attention after it had increased drastically in a small period.

The increase in value of cryptocurrencies is a relatively new phenomenon, with the initial increase in Bitcoin happening in late 2017. While Bitcoin and a handful of other major cryptocurrencies were affected by this increase, smaller coins like Dogecoin were largely unphased. The most recent peak in value occurred in early to mid 2021, and unlike the peak in 2017, many smaller coins experienced a drastic increase in value. Figure 1 shows the value of Bitcoin and Dogecoin from 2014 to mid-2021. Figure 2 specifically shows 2021, where most of the correlation between Bitcoin and Dogecoin appear to be present.

Chart, histogram

Description automatically generatedFigure 1

Figure 2.

Chart, line chart

Description automatically generated

April 2021 was a volatile period for the value of Dogecoin. Figure 3 shows the value of Dogecoin and the number of transactions that happened daily. The initial large number of transactions show could indicate a potential scheme to pump the value of the currency up before selling it later. This could explain the initial price increase that put the currency in a position to be associated with the value of Bitcoin.

Chart, line chart

Description automatically generatedFigure 3.

Candlestick plots work well for indicating the increases in value for a stock. Figure 4 shows the daily increase or decrease of value for Dogecoin and Bitcoin. The last 1/3 of the plot indicates a clear coordination of increases and decreases in value between Dogecoin (in Blue/Yellow) and Bitcoin (in Green/Red). Nearly all the occurrences of a loss for Bitcoin also show a loss for Dogecoin.

Figure 4.

Chart

Description automatically generated

The association of Dogecoin and Bitcoin can also be assessed by analyzing the rate that Dogecoin increases in value for a day against when Bitcoin also increases in value for a day, and vice versa. Figure 5 below indicates that there are many more instances where both Dogecoin and Bitcoin increased in value (or decreased in value) on the same day than when one increased/decreased and the other did not.

Figure 5.

Shape, square

Description automatically generated

In conclusion, being able to correlate the values of two cryptocurrencies could help predict the future of one of the currencies. The value of Bitcoin and Dogecoin are seemingly associated as the market fluctuations of Bitcoin have had a direct impact on the value of Dogecoin. Some of the next actions that should be taken are getting a higher resolution data set of the values of Bitcoin and Dogecoin. These datasets could be used to generate a model that indicates when a holder of Dogecoin should buy more or sell based on the fluctuations of the value of Bitcoin. While the market is incredibly volatile, especially with the value of the “less-serious” coins like Dogecoin, there could be potential to use the volatility to generate a profit.