

# Whether Cryptocurrency is a Tool of Investment?

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## ABSTRACT

In recent years, cryptocurrency is developing at a fast pace because of the big fluctuation in the prices of bitcoins. An increasing number of people decide to invest their assets into bitcoins or other types of cryptocurrencies. As a result, the idea of whether bitcoin is a good tool of investment has come out. This study describes, analyzes, and compares the different areas in bitcoins and finally draws a conclusion of bitcoins is tools of investment or not. Statistical measurements such as standard deviation, expected return, and skewness are adopted. The results are that bitcoins can bring a large amount of expected return, but also as well as a larger standard deviation, i.e., higher risks. Also, celebrities, such as Elon Musk, can have a huge impact on the market behavior of bitcoins, and it is easy for them to manipulate the market. The dramatic increase in trades of bitcoins encourages the development of other cryptocurrencies as well; for instance, dogecoins and SHIBA INU coins. This scenario leads to a mass of the market at a particular time so many governments attempted different policies to regulate the market. For example, China and the US are the two countries that held completely different views on cryptocurrency.

**Keywords:** Cryptocurrency, Bitcoins, Investment, Statistical analysis.

## 1. INTRODUCTION

The concept of Bitcoin was initiated by Satoshi Nakamoto, who was speculated by people that it is a pseudonymous name rather than the name of an actual person. On October 31, 2008, Satoshi Nakamoto published a white paper with the title "Bitcoin: A Peer-to-Peer Electronic Cash System". In this paper, Nakamoto described some of the main features Bitcoin possesses, such as the concept that it is a digital currency without a specific administrator, known as "decentralized". The first transaction of Bitcoin took place on January 12, 2009, although at that time the currency had no monetary value. A year later on May 22, a real economic transaction was performed by a Florida man called Laszlo Hanyecz, who offered a deal involving 10,000 Bitcoins in exchange for a pizza that was worth 25 dollars. [1] This event opened the usage of Bitcoin in the market, up to now, the exchange rate was developed to the ratio of 1:45483.36 USD. Within the decades of development, countless investments were performed in association with Bitcoin. Some people

obtained a fortune. According to a news report written by CNBC, Cooper Turley, who began his continuous investment in 2017 despite the volatility of the cryptocurrencies, had paid off most of his debt with the amount of money that is at least five figures. In addition, he gave his mother six figures amount of money. [2] The success cases of Bitcoin investment are truly fascinating, which attracts more people to join the investment group; however, the failed cases cannot be ignored. Cameron and Tyler Winklevoss purchased 120,000 bitcoins. At the peak of this cryptocurrency, their holdings were about 2.34 billion dollars. But now the value depreciated to 720 million dollars, which implies the loss of 1.62 billion dollars. Therefore, it is evident that Bitcoin, as an investment, gains, and losses are both significant to investors, which makes the latter need to be prepared for the uncertainty every second. [3].

Bitcoin is an emerging cryptocurrency in the market with the starting year 2009. Meiklejohn / Pomarole et al. Examined the longitudinal characteristics of Bitcoin and growth gap. Bitcoin is a completely virtual and online currency. It relies on cryptographic protection and

witnessing settlements. Protocol description, participants in-network and data collection are done. They also use their transactions and resources to identify the categories. Heuristics are addressed from the previous steps and then analyzed. Tables of the BTC, dates, movement and exchanges are used. There is also a figure containing the dates shown in their method section to illustrate their exact amount and proportion during each period. They finally draw to a conclusion and leave the analysis of the hypothesis as an interesting open problem [4]. Böhme examined the design principles of Bitcoin and recognized it as an economic presence that lacks a central authority, which makes it hard for the officials to regulate and monitor its distribution in the network. By existing in this kind of status, Bitcoin transactions, as well as their issuing, are more difficult to verify than those in the bookkeeping system. Böhme also stated that as part of the operation, Bitcoin provides new currencies to private parties regularly, as an approach to maintain later to support its bookkeeping system in the long run [5]. Eyal developed an attack to prove that the Bitcoin system can become a centralized currency with the proper method. Essentially, the attack is to collude some miners—people who maintain the log of the transactions—to receive a revenue larger than their original amount. As a result, more miners will join this particular group. The growth of the group will gradually control the Bitcoin, become the authority who controls it. As stated by Eyal, a consequence of this circumstance would be the prohibition of certain transactions. Even if the Bitcoin protocol had been developed, minors must be honest, otherwise, the prevention of the centralized Bitcoin incident would be difficult to achieve [6].

Since the release date, a vast number of Bitcoin transactions were conducted between investors. Back and Elbeck examined whether buying bitcoins is an investment or speculation. They collected the data from [www.bitcoincharts.com](http://www.bitcoincharts.com) from 2010 to 2014 as well as the S&P index value. They then compared the bitcoin market and the stock market and estimated the different coefficients and ratios for them. When showing the value and trends, there is a significant increase from 2013 to 2014, but the value and ratio for S&P 500 are more flat and steady. They finally draw to a conclusion that in terms of statistics, spread between low prices and daily high is most significant. And whether it should be considered as an investment or a speculative vehicle depends on the investor's preference for risk [7]. Kristoufek examined the potential drivers of Bitcoin prices, including fundamental sources to speculative and technical ones. Kristoufek used the Wavelet coherence figure to figure out the correlations between Bitcoin price and various components. Keristoufek discovers that Bitcoin possesses the properties of both a standard financial asset and a speculative one. Researches pointed out that Bitcoin price is negatively correlated to

the Trade-Exchange ratio, however, searches on both engines, Google and Wikipedia, are positively correlated with the Bitcoin price in the long run [8]. Haubo explores the financial asset capabilities of bitcoin using GARCH models. The initial model pointed out several similarities to gold and the dollar indicating bitcoin's capabilities and advantages as a medium of exchange. The asymmetric GARCH showed that bitcoin may be useful in risk management and ideal for risk-averse investors in anticipation of negative shocks to the market. Overall bitcoin has a place on the financial markets and in portfolio management as it can be classified as something in between gold and the American dollar on a scale from the pure medium of exchange advantages to the pure store of value advantages.[9]

Celebrity, an occupational group in society with a large number of people, is inferred to affect Bitcoin. Papryus explores can celebrities influence the bitcoin price by looking at the examples of previous news which happened during the fluctuation of the bitcoin price. Since The price of Bitcoin is speculative, it can be influenced by many factors. Experienced traders would be good at using all world news connecting with the cryptocurrency to monitor the upcoming price changes. Logically, more factors are being added to the list to influence people's decisions, such as celebrity diction like Elon musk's Twitter. Consequently, influence the price of the coin. "It is widely known that opinion leaders may factor into very different spheres." For instance, a movie star may easily make an irrelevant product famous and to bitcoin [10]. ET Spotlight Special analyzed the Extent of Elon Musk's influence on cryptocurrency as an example, and

where is it headed. They compared the timeline when musk said about cryptocurrency with the price fluctuation of the bitcoin and finds out that: whenever Elon Musk tweets about cryptocurrency, the market seems to respond to them. The article then talks about the time and what did Elon musk said about bitcoin and suggested that the core reason for the fluctuation of the bitcoin value is not what he said. However, It was not the sole reason for the market fall. The price cycle of any asset can be distinguished into four phases - Accumulation, Markup, Distribution, and Markdown. This natural cycle that any investment goes through is vital for its growth and sustenance in the long run. if we check the historical price of BTC, there is a sharp fall in its value before Elon musk's diction. Just like his tweets, these factors only act as a catalyst for driving investor sentiments [11].

This paper aims to find out the reason behind the dramatic increase in prices of bitcoins and whether bitcoins can be a tool of investment or not. Using statistical measures such as standard deviation and skewness to compare different investment tools. The

mess in cryptocurrencies is also analyzed by the development of other cryptocurrencies and the different government attitudes toward bitcoins.

**2. DATA PROCESSING**

**2.1. Data Collection**

In the data collection process, we decide to get several sets of data in different fields and compare them with bitcoin. At last, we choose to use gold, the stock of a firm called Diageo, and the S&P 500 index. The reason why we chose gold to be part of this research is because of its scarcity, the ability to circulate in the market, and the intrinsic value gold possess. These features are similar to bitcoin and can therefore help us determine whether bitcoins are good investment tools or not. Diageo plc is a multinational beverage alcohol company and its headquarter is set in London. The season why we choose to analyze and compare bitcoins and commodity industries is that we can determine what is a better option for regular investors: real commodities or fictitious currencies. The last set of data we choose is the S&P 500 index. It is a stocking market index that tracks the 500 biggest firms. This index is one of the most famous ones in the world and is recommended because of its stable performance. Lots of people decide to invest in S&P 500 index and trillions of dollars are invested in assets tied to this index [12].

All daily data of the stocks and index mention above are sourced from Yahoo Finance, in addition to the federal funds rate we sourced from the Federal Reserve Bank of New York [13].

**2.2. Statistical Measures**

The Comparison between bitcoin and other investment tools (e.g., Gold, S&P index) by using the standard deviation (1), Skewness (2) & Excess kurtosis.

**2.3. Characteristics**

It is clearly shown in the results shown above in table1 that investigating Bitcoins can generate the largest income, being more than 77% annually. However, at the same time, bitcoins are showing a fluctuating pattern and the price is arbitrary. However, as we can see above, the standard deviation of Gold is quite low, showing that the market of precious metals is stable and this has also explained the reason why people love to store a gold inventory to face unexpected problems. Skewness is a measurement of how far the distribution of data has varied from the normal distribution. From the table, it is shown that SPX and gold are negatively skewed while BTC and DEO are positively skewed. Although there is skewness on all four data, the value is close to zero, which can be

estimated as a normal distribution. Kurtosis can be interpreted as the number of outliers. SPX is the data with the highest kurtosis because it contains a wide range of companies.

**3. MUSK’S INFLUENCE ON BITCOINS**

Elon Musk, one of the wealthiest enterprises worldwide who is famous as the CEO of Tesla, also owns over 44.7 million followers in his Twitter account.

$$\text{Standard Deviation} = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}} \quad (1)$$

$$\text{Skewness} = \frac{\sum(x - \mu)^3}{\sigma^3} \quad (2)$$

$$\text{Excess kurtosis} = \frac{\sum(x - \mu)^4}{\sigma^4} - 3 \quad (3)$$

Nowadays, the man is also famous for a close connection with the bitcoin. Once he published a twitter

**Table 1.** Average return and standard deviation

	SPX	BTC	Gold	DEO
average	0.067%	0.307%	0.029%	0.062%
StDev	1.208%	4.124%	0.916%	1.368%
annualized average	16.823%	77.301%	7.296%	15.710%
annualized StDev	19.181%	65.469%	14.534%	21.723%
		%	%	

**Table 2.** Kurtosis and Skewness

	0.000145918	21.05764695	-0.763
BTC	Sample Variance	Kurtosis	Skewness
	0.001702262	4.362534073	0.321312
Gold	Sample Variance	Kurtosis	Skewness
	8.38239E-05	6.294845808	-0.21732
DEO	Sample Variance	Kurtosis	Skewness
	0.000187263	13.59296834	0.332529

SPX said: Tesla may have sold out its remaining bitcoin holdings. The price of bitcoin then drops sharply by 10% immediately. After the dramatic drop in the price, Musk then posted another Twitter and clarified that Tesla did not sell all its bitcoin. On the news, bitcoin rose to \$2,500 in the short term. It seems that it is straightforward for the price of bitcoin to be affected by the dictions of those financial celebrities. Such news makes the investors worldwide keep an eye on Musk's

tweets. His inconsistent statements and crazy ideas always dominate the cryptocurrency markets and cause significant fluctuations in the bitcoin market. The superficial phenomenon is relatively easy for people to understand, but how exactly is his dictions would cause such great changes?

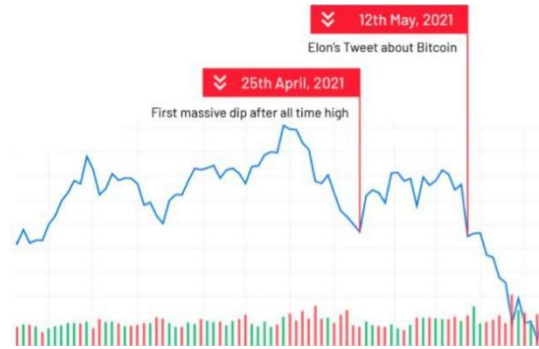
Four of Musk's tweets square measure seemingly solely reactions to previous market events and related to very little or no significant value reactions. Another two result in a substantial increase in trading volumes and positive abnormal returns [14]. The finding suggests that Musk's tweets can influence the cryptocurrency market, and many people believe that Musk's diction can dominate the market. for example, Elon Musk has admitted the tweet about

Dogecoin was a joke [15]. but considering the wealthiest person around the world claims this, nobody doesn't take it seriously. in fact, this should be clarified into the role of social media. an increase in the related tweets on bitcoin can have impacts on increasing short-term liquidity. [16] In addition, Bitcoin trading volume or returns can be explained by the number of Bitcoin-related tweets [17]. this can be why Musk's tweets can influence the price of the cryptocurrency, and considering that he is very famous and rich, people would pay more attention to his reactions. Therefore, such a phenomenon may result in the demand for bitcoin and bring up the trading volume.

However, the real problem should be whether Musk's diction leads to the fluctuations in the cryptocurrency market, or the information from the market guides Musk to make his insight and then influence a tremendous change in the market?

The logic from above seems that Elon Musk is controlling the whole market alone. However, if we take a deeper look at cryptocurrency as an investment tool suggests otherwise. It might distinguish the worth cycle of any plus into four phases - Accumulation, Markup, Distribution, and Markdown. This natural cycle that any investment goes through is significant for its growth and sustenance within the long-standing time. [18]

When the cryptocurrency market picked up towards the top of 2020, it went through the buildup section, wherever most investors entered it. Towards the period 2021, the currency marked up and settled at an uncomparable high of \$60,000. The distribution began once the RSI indicator showed that the quality was overbought, slowly triggering a markdown. Such tendency cannot be identified towards Musk's tweets if we take a look at the historical price of BTC:



**Figure 1** The price of BTC from March to May in 2021

Figure 1 shows that there was a steep fall in its price even before Tesla created any announcements. Elon Musk took a turnabout concerning his opinion on Bitcoin in a while twelfth might, indicating that it had been not the primary downtrend in its price.[18]. in this case, Elon Musk's tweets just act as a catalyst for the much-anticipated correction within the crypto market, and nowadays, many technical analysts believe that Bitcoin was overbought at that time and required a trigger to fall and proper itself.

The celebrity effect directly shows how risky it is in the bitcoin market, and whether bitcoin can be a good investment depends on the information you get.

#### **4. DEVELOPMENT OF OTHER CRYPTOCURRENCIES**

##### **4.1. History**

Cryptocurrency by definition is a digital currency where all transactions are recorded and all information maintained by a decentralized system. The way to achieve this decentralization is using cryptography, instead of a centralized authority [19]. Recently cryptocurrencies have been expanding at a fast pace because of the dramatic increase in the prices of bitcoins. Generally, the main reasons why bitcoins have a huge increase in their price are because of the decentralization and the consensus of trading among people. Another special point is that bitcoins are also designed to be resistant to inflation to preserve the assets. These characters of bitcoins make more and more people decide to invest in bitcoins, and the market value for bitcoins rose dramatically.

##### **4.2. Intrinsic Value and Consensus**

Starting with dollars or any country's currency. The intrinsic values inside cash and coins are almost negligible. The reason why money is a measure of wealth and price is because of the consensus among people. It can be accepted as a mediate of exchange because of the common agreement among people to use them. Similar to bitcoins, the value comes from consensus. Cryptocurrencies even have less 'real' value

than cash as it is completely online currency. However, due to the special characters of bitcoins, i.e., decentralization, it is not under the regulation of the central government, so many hidden market traders are willing to use them as a mediate of trade. As more and more people accept bitcoins to be used as mediate of exchange, the consensus of bitcoins rises, leading to a result more people believe bitcoins has its value.

**4.3. Typical Examples: Dogecoins and SHIBA INU coins**

Dogecoin is invented as a satire on bitcoins by two software engineers Billy Markus and Jackson Palmer. Since the beginning of dogecoins is a ‘joke currency’, there are an unlimited amount of coins issued. The code and structure are a pirate version of existing coins.



**Figure 2** The price of Dogecoin from 2014 to 2021

Ironically, as shown in fig2, the value of pirate coins has gradually increased. Following the low and steady price from 2014 to 2019, the value rose gradually from Mar 2021. This is not a natural market trend but a manipulation from capitalists. Because of Elon Musk’s Twitter post "To the moon!", with a picture of dogecoins. People thought he is describing the future behavior of dogecoins. as a result, more and more people try to invest in cryptocurrencies. Although as mentioned before ‘coins’ themselves do not have intrinsic values, it has the market price because there are consensuses among people.



**Figure 3** The price of SHIBA INU from 2020 to 2021

Investors with crowd mentality followed by those ‘celebrity’s speak and pushed the price of dogecoins to a new value.

This research describes the development of new cryptocurrencies as a mess because anyone can create their currency at this time and the market price can be controlled by one person. Too many new currencies have appeared such as Shibacoins, Litecoins, Quarkcoins, and so forth. Since the decentralization of cryptocurrencies, it is hard for the government to regulate the currency market. It is shown that only a small number of ‘whales’ owns the most proportion of dogecoins [20]. As a result, the majority of investors may lose their money under the control of capitalists.

**4.4. Manipulation behind cryptocurrencies**

From the two overall trends of dogecoins and SHIBA INU coins, we can see clearly that there is a dramatic increase in March 2021. This does not happen naturally. Elon Musk’s speak changes the trend of cryptocurrencies. There are three posts on Musk’s Twitter about dogecoins. From 18 July 2020, the first twitter is posted and the trend of dogecoins and Shibainu coins rose to an extremely high level.

From my point of view, I think cryptocurrencies should not be considered a good investment. It is more likely a speculative tool, especially for some entrepreneurs like Musk. As mentioned before, the prices of bitcoins, dogecoins, and even SHIBA INU coins, rapid increase in prices in short term also results from a huge decrease in prices. All of these market events can be manipulated by several ‘whales’ investors. As a result, as individual investors, choosing bitcoins as an investment will have to take more risks and the market may be easily controlled by capitalists.

**5. FUTURE GOVERNMENT REGULATION**

Countries’ regulations towards Bitcoin vary in detail. However, from macro-evaluation, countries around the globe can be categorized into two groups: one group that is open-minded to activities involving Bitcoin, and another group that rejects them. The former includes countries such as the United States and the latter includes countries such as China. In this section, the United States and China will be discussed as examples for the respective category.

In the United States, Bitcoin, along with other cryptocurrencies, is being monitored by the Federal and State government. Commodities and Futures Trading Commission, Internal Revenue Service, and Securities and Exchange Commission are some of the Federal agencies that pay close attention to Bitcoin. According to Global Legal Insights, for Federal agencies, technology is a vital item to the development of the United States, so the risk of over-regulating cryptocurrencies had been taken into account while scrutinizing. Similarly, some states passed laws that

exclude Bitcoin from money transmission laws and state securities law, intending to promote investment in technology sectors, hence boosting the local economy and improving public service. One example is Colorado, where it established a bipartisan bill that exempted cryptocurrencies, including Bitcoin, from state securities regulation. Overall, the United States holds a relatively high acceptance of the transactions of Bitcoin and recognizes it as a feasible approach to promote the economy while deploying regulations [21].

Back in 2013, China introduced the first ban on Bitcoin and other cryptocurrencies, four years later, the People's Bank of China specifically closed local exchange of such items. However, Chinese investors can still conduct Bitcoin transactions on platforms that are owned by overseas enterprises. In May 2021, China's State Council's Financial Stability Committee had established a stricter regulation on Bitcoin mining and trading activities. One of the methods the People's Bank of China used to ensure the laws are properly implemented, is the collaboration with other financial institutions such as Alipay. They were instructed to identify customers who have their accounts in cryptocurrency exchanges activities and cut them off from receiving and sending transactions. Before the laws passed, China is accounted as the largest cryptocurrencies mining field in the world. It is said by the Global Times that the launch of new laws would result in the closedown of 90% of China's Bitcoin mining capacity [22].

Despite the different regulations in the contemporary market, it had been predicted that the regulation of Bitcoin will be stricter and tougher in the future. As discussed, China had passed several laws strengthening the local Bitcoin regulations. This action may impact other nations, making them develop further. The incident with this characteristic can be referred to July 16, 2021, when People's Bank of China published a white paper on China's digital currency, US treasury secretary Janet Yellen proposed to develop cryptocurrencies' monitoring framework. If this is not a coincidence, then it is to be assumed that a change in a country's regulating rules will create an effect on the corresponding aspect of other countries as well. In addition, Gensler, the head of the Securities and Exchange Commission, promised more regulations will be launched to protect the investors. One of the foremost issues that need to be resolved is the definition of cryptocurrencies. Because cryptocurrency is a relatively new item in this world, some of its aspects have not been defined thoroughly yet. For instance, is Bitcoin a commodity or not? If so, who should be the authority to regulate it? This type of question does not have finite answers yet, and according to NPR news, this would be one of the priorities to be considered. In conclusion, it is not certain whether governments in different countries will change their attitudes towards

Bitcoin in the future, but there is a high possibility that the regulations will be developed in a stricter direction [23].

## 6. CONCLUSION

This article illustrates whether bitcoin can be identified as a good investment to the public from four main dimensions. It starts at analyzing the standard deviation and Gaussian distribution of bitcoin, and the results have shown that bitcoin is quite different from other traditional assets like gold and stocks, the annualized standard deviation of bitcoin indicating that the market is fluctuating. Then using Elon Musk is an example to help research the celebrity effect on the highly fluctuating bitcoin market. The finding suggests that under the unpredictable situation, although it seems like some powerful businessmen are dominating the markets, they actually act like a catalyst to boost some changes on the bitcoin price, and bitcoin still has its path just like the other type of cryptocurrencies. Furthermore, because of the huge fluctuation in bitcoin price, more people think that a cryptocurrency is a good tool of investment, and we have done the history and showed that how the relationship between other petrocurrencies works. Last, this study focuses on different government regulations towards bitcoin. It is predicted that the regulation will be gradually strengthened across the globe in the future. This process will most likely start with the clearance of conceptual vagueness that exists in the current market.

The point of the paper is to provide people who would like to invest in bitcoin guidance. Whether bitcoin is a good investment is still a normative statement, and it depends on how much information the investors get.

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