The Impact of Bitcoin's Search Volume on Its Price Fluctuations

Qing Jilang

School of Economics, Nankai University, Tianjin, 300110, China

Abstract: From the concept of electronic currency proposed by Satoshi Nakamoto in 2008 to the official birth of Bitcoin in 2009, the virtual currency began to become a force that can not be ignored in the financial market. From the very beginning, it was not favored by the market. Now the entire virtual currency market is booming. With development, a variety of virtual currencies have sprung up like mushrooms after a rain, and the value of a Bitcoin has exceeded the 50,000 U.S. dollar mark. This volatile price also reflects the attitude of investors towards Bitcoin. Variety. Virtual currencies such as Bitcoin do not have physical or credit endorsements, and their market prices are largely determined by factors such as government supervision and policies, media influence, users' transaction behavior, and transaction needs. We can make some references for the financial investment of virtual currency by studying the influence of factors such as the search index of Bitcoin entries and media influence on Bitcoin price fluctuations.

1. Introduction

Bitcoin, as an electronic currency with no actual value endorsement behind it, is actually determined to a large extent by the market's attention to it. Therefore, this article will study the relationship between the daily search volume of Bitcoin and the change in Bitcoin price on that day to determine whether the attention paid to Bitcoin will affect its market price. Considering that the global daily search index of Bitcoin entries can reflect the size of the media influence and the customer's attention to Bitcoin, and then approximately reflect the user's attention to and participation in Bitcoin transactions. This article will use the ols regression model to analyze whether there is a relationship between the Bitcoin search index in recent years and the rise and fall of the Bitcoin price on the day to analyze the media influence and user transaction demand for Bitcoin prices. What kind of impact.

2. Model Construction

2.1 Model Construction

According to the global search popularity of Bitcoin entries displayed on Google, the proportion of Bitcoin searches in China accounted for more than 80% of the global search volume, so the search volume in China can be used to approximate the global Bitcoin search volume.

At the same time, considering the natural cyclicality of the economy, there will be some cyclical fluctuations in each quarter of the year, so different quarters are used as auxiliary judgment variables to be added to the regression to determine whether it has an impact on the results of direct research. Besides, the gradual development of the economy and information may also affect the search volume. Therefore, different years are used as variables to regress with the search volume to determine whether the development of information interaction technology has an exogenous impact on the research data.

2.2 Experimental results

Based on the above content, the Bitcoin Baidu search index is used as the independent variable SI (search index), three dummy variables (q1, q2, q3) are made based on four quarters, and two are made based on the three years that the data spans. Dummy variables (year1, year2), take the absolute value of the daily Bitcoin market price change percentage as the dependent variable Price. The construction model is as follows:

$$Price = \beta_0 + \beta_1 SI + \beta_2 q_1 + \beta_3 q_2 + \beta_4 q_3 + \beta_5 year_1 + \beta_6 year_2$$

2.3 Variable Interpretation

Bitcoin Baidu Search Index (SI): Select Bitcoin's Bitcoin Baidu Search Index from December 31, 2018, to March 7, 2021, as the independent variable SI (search index).

Quarterly dummy variables (q1, q2, q3): q1 is defined as the value of the first quarter is 1, the value of other quarters is 0, q2 is defined as the value of the second quarter is 1, and the value of other quarters is 0, q3 It is defined as the value of the third quarter is 1 and the value of other quarters is 0. When the values of q1, q2, and q3 are all 0, it is the fourth quarter.

Year dummy variables (year1, year2): year1 is defined as the value of 2019 is 1, the value of other years is 0, and the value of year2 is defined as the value of 2020 is 1, and the value of other years is 0. When the values of year1 and year2 are both 0, the year used for the data is 2021. Finally, the absolute value of the daily Bitcoin market price fluctuation percentage is taken as the absolute value of the dependent variable Bitcoin price fluctuation percentage absolute value (Price): Because the research is about whether the search volume has an impact on price changes, and to consider the price band of Bitcoin Whether the impact is positive or negative, the absolute value of the price fluctuation range can be taken.

2.3 Expected Results

The expected results of this experiment: (1) Bitcoin's daily search volume and search index have a significant impact on the size of its daily price fluctuations and have a positive relationship, but the Bitcoin market is relatively volatile, and the two may not be A linear relationship with a good degree of integration.

(2) With the development of information interaction, the search volume in 2021 may increase compared to the previous two years, but this may not necessarily reflect the corresponding price fluctuations.

3. Experimental Process

Take the absolute value of the Bitcoin price increase and decrease on the day and the search index as the horizontal and vertical axes, and make a scatter chart to observe the relationship between the two. To avoid the data being too dense and inconvenient to observe, the data is changed

to a weekly unit, and weekly search The index is the average of the search index for the seven days of the week.

It can be roughly observed that there is a positive relationship between the price increase and decrease of Bitcoin in a single day and the search index. Then ols regression processing is performed on the original data.

Through the ols least squares method, according to the model Price=$\beta 0+\beta 1SI+\beta 2q1+\beta 3q2+\beta 4q3+\beta 5year1+\beta 6year2$.It can be seen from the prob value of the regression result that the prob value corresponding to IS is less than 0.05, that is, the search index has a significant impact on the rise and fall of the bitcoin market price on that day. The fitting curve is:

PRICE =3.14904691929e-07*IS-0.000484012060723*Q1+0.00212638950435*Q2-0.000804604727408*Q3-0.00478218980385*YEAR1-0.00381182030438*YEAR2+0.0164767772335, but the goodness of fit is only 0.19277 relatively poor, this shows that there is still a strong uncertainty in the rise and fall of the Bitcoin market, and there is no clear quantitative relationship between it and the daily search index.

To further analyze the impact of cyclicality and year, add the dummy variable Q4, and year3 corresponds to the fourth quarter and 2021. Select the dependent variable Price, the independent variable IS and two of the three-year dummy variables to perform regression. It is concluded that the difference in the four quarters has no significant impact on the absolute value of the bitcoin price that day.

In the same way, similar processing of the year dummy variable .It is concluded that different years have no significant impact on the absolute value of the bitcoin price on the day. Re-analyze the relationship between the year and the search index, using IS as the dependent variable, and analyze the relationship between it and the year dummy variable. It is concluded that the search index in 2021 has significantly changed from the previous two years, but this change has not been reflected in the further impact on the price increase and decrease.

4. Experimental Results

From the results of this data analysis, the absolute value of the daily price increase and decrease of Bitcoin is significantly affected by the search index of the day, and the same conclusion can be obtained when the data is extended to the weekly time unit. As far as the experimental results are concerned, the data of the past three years indicate that the results of the daily price increase and decrease of Bitcoin are not affected by quarters, are not cyclical, and have no significant correlation with the year. Although the Bitcoin search index in 2021 is significantly higher than the Bitcoin search index in 2019 and 2020, such an increase in the search index is not fully reflected in the further expansion of price fluctuations. Generally speaking, the price of Bitcoin has a positive relationship with the search index.

5. Result Evaluation

The results of this data analysis are the same as the predicted results. The data selection includes Bitcoin-related data from 2019 to the present, but there are still areas for improvement in the experiment. The factors selected this time are mainly time and search index, but many other factors related to Bitcoin are ignored, such as the existing stock of Bitcoin, per capita disposable income and Bitcoin mining costs, etc., which may also affect The market price of Bitcoin. Besides, selecting a relatively short period can further expand the sample size and explore the law of Bitcoin price changes more accurately and deeply.

References

[1] Yang Kai. (2020). Research on the impact of investor attention on the price of Bitcoin. (Doctoral dissertation, Shanghai International Studies University).