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Research on the Relationship Between the Cryptocurrency Greed Index and Liquidation Amounts

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Abstract:

Nowadays, the price of cryptocurrencies, especially its representative currency Bitcoin, has risen sharply. However, the high volatility of Bitcoin makes it easy for many contracts to explode in a short period. Meanwhile, the Greed Index is a virtual currency platform launched to measure the emotional state of various cryptocurrency users towards the currency, whether they are greedy or fearful. This paper aims to explore the specific relationship between the amount of Bitcoin's exposure and the greed index by exploring the linear programming model. Nowadays, many studies and theories have been launched to study the factors that affect cryptocurrencies and to speculate on the price trend of cryptocurrencies. However, what many studies fail to note is that the contract market for cryptocurrencies is also very active, and many cryptocurrency users attempt to use leverage to make high profits, and this behavior is very influenced by emotions. This article finds a relationship between the amount of cryptocurrency Liquidation and the Greed Index. This paper hopes to use the quantitative model to explain the specific trend and influence relationship, and at the same time for investors and market regulators a new way of thinking.

Keywords: Cryptocurrency greed index; liquidation amounts; Relationship analysis.

1. Introduction

The cryptocurrency market has experienced significant growth since Bitcoin was first launched in 2009. As technology advances and people's demand for decentralized financial systems increases, the variety and number of cryptocurrencies keep growing. In addition to Bitcoin, Ethereum, Litecoin, Ripple and other cryptocurrencies have also appeared on the market. According to data from May 2024, the total market capitalization of the cryptocurrency market has exceeded the trillion-dollar mark, while the price of bitcoin has exceeded $70,000, reaching an all-time high. It has attracted widespread attention from global investors and institutions. Numerous economists have attempted to explore the operation of cryptocurrencies from various angles. In the eyes of some, Global real economic activity provides excellent volatility predictors for bull and bear markets [1].

However, while many data points point to the benefits of cryptocurrencies, some economists point out that some data may give us the opposite conclusion. Liquidation, for example, refers to the percentage of investors holding highly leveraged positions that are forced to liquidate their positions during a given period due to wild movements in market prices. High blowout rates usually reflect high risk and volatility in the market. Interestingly, in Bitcoin's 2024 data, although the price increase is very welcome, because the liquidation caused by long and short positions also remains high, meaning that many cryptocurrency users do not profit. The Greed Index is a measure of market sentiment, usually calculated based on a combination of market data such as price movements, trading volumes, social media sentiment, etc. The Greed index reflects the emotional state of market participants - greed or fear. A high greed index usually means that market sentiment is high and investors are overly optimistic, which can signal that the market is at risk of an imminent correction. A low greed index indicates that there is a lot of fear in the market and investors are inclined to sell assets. Some studies have pointed out that the crypto fear and greed index (FGI) and the relationship presentation patterns between price peers are not linear[2]. This shows that emotional values can be affected by the price of an encrypted currency market. The Greed Index since 2024 has also increased significantly compared to the past, meaning that today's cryptocurrency users are more aggressive than ever. Greedy users are likely to be more inclined to use contracts and leverage to maximize revenue, which can also double losses.

The main purpose of this study is to systematically ex-

plore the relationship between the burnout rate and the greed index in the cryptocurrency market. Through the analysis of these two key indicators, it can better understand the interaction between market sentiment and market volatility. This article will use 84 sets of data from February 29, 2024, to May 22, 2024, to explore the relationship between the cryptocurrency burnout rate and the Greed index in the short term. At the same time, identify and analyze other factors that may affect the relationship between burnout rate and greed index, such as volatility, price, etc. Based on the existing market theory and literature, this study proposes the following hypothesis: the higher the greed index, the more likely the market is to have a high burst rate. This assumption is based on the logic that when market sentiment is high, investors generally show a higher appetite for risk and tend to trade with higher leverage. Since highly leveraged trading is accompanied by greater risk, it is more likely to lead to the occurrence of short positions when there is a large fluctuation in the market. Therefore, it is expected that during periods when the greed index is high, the burnout rate in the market will increase accordingly.

The significance of this article is very diverse. Understanding the relationship between explosion and greed index helps investors to better manage risk, and in highly aggressive encryption money markets, it is important to understand the relationship between explosion and greed indices: investors can use the greed index as a target for market sentiment, be vigilant in high greed, and reduce leverage to avoid the risk of explosion. By paying close attention to market sentiment, investors can make adjustments more timely and reduce potential losses. It also provides a reference for market supervision. The high mobility and high-risk characteristics of the encrypted money market pose new challenges to market regulation. Regulators can build early warning systems based on greed indices and explosive positions. When market sentiment is too high, the warning system can prompt regulators to focus on market risks and take immediate steps, such as restricting leverage, to avoid systemic risk.

2. Literature Review

Liquidation is a key concept in the cryptocurrency market, particularly in leverage and derivatives trading. It refers to the process by which assets held are forced to be sold or liquidated due to insufficient margin. When investors use leverage to trade, they borrow money to make larger trades. Leverage magnifies potential gains, but it also magnifies potential losses. To maintain a leveraged position, the investor must maintain a certain margin, and if the investor fails to raise the margin within the specified time, the platform will force the liquidation of the position to prevent further losses. The platform automatically sells part or all of an investor's position to cover losses.

Liquidation events usually occur when the market moves violently, and a large number of forced selling or buying can further exacerbate market volatility. For example, when prices fall sharply, a large number of leveraged positions are liquidated, causing more selling to flood the market and accelerating the price decline. A large liquidation event can set off a chain reaction that leads to more positions being liquidated, creating a vicious circle. This is especially true in illiquid markets. Frequent liquidation events tend to trigger market panic, and investors may sell assets for fear of further price declines, forming a negative sentiment cycle. After multiple liquidations, investors may become more cautious, reduce leverage, and reduce risk exposure, which may reduce market activity in the short term.

Market liquidity structures could also be affected by Liquidation. The cryptocurrency market provides liquidity and takes orders from investors. This requires managing appropriate inventory risk [3]. Nowadays, numerous models have been designed to study the volatility of cryptocurrencies, such as MRS-MIADS, to study the persistence of high volatility mechanisms. Frequent clearing events may prompt trading platforms to adjust leverage limits, lower leverage caps or raise margin requirements to reduce market risk [4]. The platform may introduce more stringent risk control measures, such as real-time monitoring and automatic reduction of positions, to prevent the impact of large-scale liquidation on the market.

The greed index, often known as fear and greed, is a tool for measuring mood in the market. It reflects the emotional state of market participants -- from extreme fear to extreme greed. The greed index can help investors understand the mood of the market and make smarter investment decisions. The greed index usually ranges from 0 to 100, of which zero means extreme fear, and 100 means extreme greed. It has been shown that the Fear and Greed Index (FG) has significant in-sample and out-of-sample predictive power over a prediction range of 1 day to 1 week. The predictive power of FG exists in individual cryptocurrencies and different market indices [5].

The Greed Index affects prices, investor psychology, and market regulation. For prices, when the greed index is high, the market is overly optimistic and prices can be pushed to unreasonable levels. When the greed index is low, the market is overly pessimistic and the price may be depressed. After extreme sentiment, the market often undergoes a correction and returns to more reasonable price levels. At the same time, the greed index is also a way to predict the psychology of investors. The greed index can

reveal cognitive biases in the market, such as overconfidence and the bandwagon effect. Understanding these biases can help investors improve the quality of their decisions. It has been reported that Google's search interest in cryptocurrencies, as a direct manifestation of emotional value, is crucial in choosing the right type of cryptocurrency [6]. Investors can use the Greed index to manage their emotions and avoid making irrational decisions when market sentiment is extreme. In market regulation, the greed index can be used as a market early warning tool to help regulators take preventive measures when market sentiment is extreme, such as restricting leveraged trading and increasing margin requirements. In the cryptocurrency market, price bubbles are more common than in other markets, and market sentiment is a major contributor [7]. Regulators can adjust market supervision strategies according to changes in the greed index to prevent systemic risks. Further, publicizing the greed index and its changing trends can help increase market transparency and investor confidence.

3. Methods

This article obtained data from Coingalss, Bil123, and Biance on Bitcoin's historical volatility, Greed index, price, and blowout amount from February 29, 2024, to May 22, 2024 [8-10].

In the first part, the article argues that only the greed index of cryptocurrencies affects the liquidation amount of cryptocurrencies. At the same time, due to the dense data, additional robustness testing is required to eliminate the effects of uneven data distribution. Introducing the natural logarithm of a cryptocurrency's liquidation amount as a new dependent variable is an effective way to prevent the relationship between the two from not being linear.

However, many factors affect the liquidation amount of cryptocurrencies and are related to each other. This section will add the dependent variables discussed in order to come up with a more accurate picture of the effect of a cryptocurrency's greed index on the liquidation amount of a cryptocurrency.

Market volatility, that is, drastic changes in market prices, has a significant impact on both the Greed index and the burn rate. When market volatility is high, sharp price changes can cause extreme swings in investor sentiment. For example, a sharp rise will trigger greed in investors, and a sharp fall will trigger fear. The Greed index reflects this mood swing among market participants, so high volatility usually leads to dramatic changes in the greed index. High volatility not only drives changes in market sentiment, it amplifies it. For example, when prices rise sharply, investor optimism and greed will be amplified, driving the greed index higher. This emotional drive will eventually affect investment behavior, namely aggressive chasing and panic selling. During periods of high volatility, if the market continues to rise, investors tend to chase it higher, pushing prices even higher and causing the greed index to rise. Conversely, when the market falls rapidly, investors may panic sell, causing the greed index to fall rapidly.

The impact of market volatility on the burnout rate of the cryptocurrency market is also very obvious. In a highly volatile market, sharp changes in prices can put tremendous pressure on cryptocurrency users who hold highly leveraged contract positions. A sudden drop in prices can cause leveraged users to lose their positions quickly, triggering forced closing and increasing the rate of exposure. More serious is the high volatility environment, traditional risk management tools such as stop loss orders may not be effective promptly, resulting in more positions being forced to close.

Taken together, there is a positive feedback mechanism between market volatility, greed index and liquidation amount. High volatility drives the Greed Index higher, and investors increase leverage trading, further driving up market volatility, ultimately leading to higher burn rates, and liquidation amounts. Extreme changes in market sentiment can be contagious among investors, leading to herd behavior that further amplifies market volatility. For example, when the market is rising, optimism and greed indices rise and more investors rush into the market, pushing prices higher. When the market falls, panic spreads, causing more positions to explode and prices to fall further.

4. Result and Discussion

4.1 Single Factor

In the first part, this paper sets Outstock as the dependent variable, representing the amount of Bitcoin liquidation daily, and Greedindex as the independent variable, representing the greed index estimated for that day. Because the dates chosen are between February 29, 2024, and May 22, 2024, it can be assumed that there are no major policy events that have affected the amount of liquidation and people's greed index on a macro level. In the regression of the first part, this paper argues that the amount of Bitcoin liquidation affected only by the Greed index is:

$$\text{Outstock}=\beta_0+\beta_1\text{Greed index}+\varepsilon_i \quad (1)$$

The article then uses stata17 as a regression tool for linear programming.

Table 1. Reg Outstock Greedindex

Outstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	40.60315	11.13808	3.65	0.000
_cons	-1915.941	816.7245	-2.35	0.021

Next, this paper uses stata17 as a regression tool for linear programming.

As shown in Table 1, it is found in this paper that the t value of the greed index is 3.65, which means that the linear programming is very successful this time. At the same time, it can be concluded that when only the effect of the greed index of cryptocurrency users on the amount of cryptocurrency liquidation is considered, every little increase in the greed index will increase the liquidation of the cryptocurrency by $400,000.

However, it is easy to see that x, or Greedindex, is not evenly distributed. Because among the 84 data selected, the size of the greed index is not lower than 40, and most of the greed index values are concentrated around 70, it is necessary to check the robustness of the linear programming to ensure the correctness of our answers.

Table 2. Reg Outstock Greedindex, robust

Outstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	40.60315	9.422862	4.31	0.000
_cons	-1915.941	658.1089	-2.91	0.005

In Table 2, it can be found in this paper that after adding the “robust” command and letting stata adjust itself, the standard deviation of Greedindex becomes smaller, which means that the increase of T-value and more confidence to explain the amount of cryptocurrency liquidation is related to the greed index of cryptocurrency users.

At the same time, because the degree of change in the greed index is small and the amount of the encrypted currency is changed greatly, the relationship between the independent and the dependent variables is not linear. You can change the relationship between the logarithm of the encrypted currency and the greed index for the amount of the encrypted currency. In this case, it should set up a new dependent variable lnoutstock, which represents the natural log of the once variable, using the relationship between the new dependent variable and the independent variable. The current formula is:

$$\ln\text{Outstock}=\beta_0+\beta_1\text{Greed index}+\varepsilon_i \quad (2)$$

Table 3. Reg lnOutstock Greedindex

lnOutstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	0.0542827	0.0139925	3.88	0.000
_cons	2.462459	1.026035	2.40	0.019

Table 4. Reg lnOutstock Greedindex, robust

lnOutstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	0.0542827	0.0126998	4.27	0.000
_cons	2.462459	0.9595603	2.57	0.012

Table 3 and Table 4 show that, after factoring in the natural logarithm of the dependent variable, the linear relationship between the new dependent variable and the independent variable is more significant than the original one. After robust modification in this case, the T-value of the independent variable reaches 4.27. According to regression, for every 1 unit increase in the Greed index, the amount of cryptocurrency liquidation increases by 5%.

4.2 Multifactor

The introduction of volatility in market volatility can guarantee a more accurate prediction of the relationship

between the greed index and the amount of the encrypted currency. Also, the analysis of the linear programming of multi-factor, which is included in the analysis of the multi-factor linear programming of the multi-factor, is included in July 29, 2024, and May 22, 2024.

$$Outstock=\beta_0+\beta_1 Greedindex+\beta_2 volatility+\varepsilon_i \quad (3)$$

The same number of instructions will still be entered to ensure that the regression does not violate the assumption of assumption 3 and that the results are more accurate.

Table 5. Reg Outstock Greedindex volatility

Outstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	26.96953	10.93402	2.47	0.016
volatility	63816.99	16821.05	3.79	0.000
_cons	-2958.438	805.5378	-3.67	0.000

Table 6. Reg Outstock Greedindex volatility, robust

Outstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	26.96953	10.00106	2.70	0.009
volatility	63816.99	16524.98	3.86	0.000
_cons	-2958.438	684.6072	-4.32	0.000

In the Table 5 and Table 6 experiment, both the coefficient and T-value of the dependent variable Greedindex were reduced to a certain extent, largely because liquidity accounted for 25% in the calculation of greed index. However, this experiment also proved that the remaining calculation factors in greed index were not useless, such as market momentum/volume, social media sentiment, market research, etc. Dominance and google trends also affect prices.

Replacing the dependent variable with the natural logarithm of the liquidation amount in the cryptocurrency may give a more accurate answer.

$$lnOutstock=\beta_0+\beta_1 Greedindex+\beta_2 volatility+\varepsilon_i \quad (4)$$

Table 7. Reg lnOutstock Greedindex volatility

lnOutstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	0.0368758	0.013696	2.69	0.009
volatility	81.47886	21.07015	3.87	0.000
_cons	1.131442	1.009022	1.12	0.265

Table 8. Reg lnOutstock Greedindex volatility, robust

lnOutstock	Coefficient	Std. Err.	t	P>|t|
Greedindex	0.0368758	0.0125074	2.95	0.004
volatility	81.47886	16524.98	4.73	0.000
_cons	1.131442	684.6072	1.07	0.287

The results of Table 7 and Table 8 show that the natural log of the amount of the encrypted currency is better. The modified regression shows that when the volatility rate is constant and the greed index increases by 1 point, the amount of the encrypted currency increases by 1.2%, while the amount of the encrypted currency increases by 0.81%when the greed index is unchanged and the volatility rate increases by 1%.

5. Conclusion

From the results, there is a significant positive correla-

tion between the greed index and the rate of liquidation. That is, when the market sentiment is in a state of high greed, the rate of exposure is often higher. This suggests that market participants tend to trade with higher leverage when greed is running high, increasing the risk of a blowout. The addition of the variable volatility also reveals more information. During the period of high greed index, the market volatility increased significantly, which further exacerbated the rise of the exposure rate. This amplification effect shows that extreme changes in market sentiment not only drive price volatility but also amplify market risk.

This research also has practical application value. By monitoring the Greed index, investors can better manage their emotions and avoid making irrational decisions when market sentiment is extreme. Investors can dynamically adjust their investment strategies according to changes in the greed index. When market sentiment is high, adopt more conservative strategies, such as reducing leverage and increasing the proportion of cash held to reduce the risk of blowout. For trading platforms, trading platforms can adjust leverage limits and margin requirements in response to changes in the greed index. In the period of high greed index, the leverage ratio is appropriately reduced and the margin requirement is increased to prevent large-scale blowout events. Regulators can also use the greed index as a market risk warning tool to take preventive measures when market sentiment is extreme, such as limiting leveraged trading, increasing market transparency, and so on, to prevent systemic risks.

However, there are some shortcomings in this paper. For example, in the multi-factor range, only the influence of market volatility on the relationship between the two is discussed, and no further discussion is made. It is quite possible that there are other factors affecting the liquidation amount of cryptocurrencies and the greed index of cryptocurrencies. At the same time, even if the period chosen in this article is short enough, there are many policy timing and technical events that will affect the price of Bitcoin between February 29, 2024 and May 22, 2024, such as the Bitcoin halving in April. Each of these events may affect regression.

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