

Analysis of Different Trading Strategy Applicability to Cryptocurrency Market

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Abstract. Since cryptocurrency trading and regulatory mechanisms are not yet mature, and there are few studies on the applicability of various trading strategies, it is necessary to conduct research on cryptocurrency market trading strategies to promote its healthy development. To this end, using the commonly used historical price data of Bitcoin, Ethereum, and Litecoin, the strategies of pairs trading, momentum trading, and grid trading are applied to analyze their trading characteristics, explore their applicability, and put forward relevant suggestions. The research results show that each trading strategy has its applicable market environment, and the trading strategy should be reasonably selected according to the market situation. Pairs trading uses cryptocurrency pairs with strong correlations to select a reasonable trading range according to their residual swings trend. Its trading volatility and yield are low but relatively stable. Momentum trading is suitable for highly volatile cryptocurrencies. The Moving Average Convergence and Divergence (MACD) and the Relative Strength Index (RSI) can be comprehensively applied to effectively reduce the number of momentum transactions and improve the accuracy of price swings trend prediction. Grid trading can achieve stable and considerable returns in a market with long-term strong volatility, but transactions are more frequent. The number and size of grids should be dynamically adjusted according to the value and volatility of cryptocurrencies and combined with market changes.

Keywords: Cryptocurrency, pairs trading, momentum trading, grid trading, applicability.

1. Introduction

In the digital economy era, a new form of currency - digital currency (hereinafter referred to as cryptocurrency) exists in electronic form. It relies on cryptographic technology to provide security and privacy protection functions, and is convenient, fast, and low-cost [1]. The cryptocurrency market has attracted many investors and researchers with its high volatility and potential high returns [2]. Unlike traditional markets, the cryptocurrency market has 24-hour uninterrupted trading, global circulation, and low market threshold, making it possible to apply more trading strategies. However, due to the high volatility and uncertainty of the cryptocurrency market, effectively selecting and applying appropriate investment strategies to cope with market risks has become an important issue for investors [3].

At present, quantitative investment strategies are a hot topic of research, including traditional trading strategies such as the Martingale strategy, CTA quantitative strategy (e.g. trend strategy, reversal strategy, arbitrage strategy, high-frequency arbitrage strategy), grid strategy [3], and the construction of their digital models. With the help of modern digital analysis methods and means to assist investment behavior, these strategies are applied to obtain investment results that are higher than the market average earnings. For example, Zhang Siyi [4] introduced a dynamic valuation model that uses momentum, investor attention, and cryptocurrency valuation ratio in related research. By regression, it is found that there is a strong positive correlation between the cumulative return of the cryptocurrency market in the next 1 to 8 weeks and the current cryptocurrency market return. Zhou Xu [5] selected four digital currencies as research objects and explored the feasibility of Bollinger Band strategy in the digital currency market by Hurst index analysis, Bollinger Band trend breakthrough strategy quantification, and parameter optimization to perform return retest analysis. Pan Pincheng [6] introduced the application research of momentum trading strategy in the short-term returns of the cryptocurrency market. By using 9 momentum trading strategies, the three-year market data of 12 cryptocurrencies were analyzed, and it was pointed out that momentum trading strategy

can obtain positive trading returns in the short term. Mei Yan [7] constructed a Bitcoin statistical arbitrage strategy based on a grid search algorithm and optimized the parameters of the random forest model using the grid search algorithm, achieving good profits. Previous years of research and application have proven that different trading strategies have different applicable conditions in traditional financial markets. For the emerging cryptocurrency market with high volatility and global circulation, there are relatively few comparative analyses of the applicable conditions and differences between different traditional trading strategies.

In the face of the emerging cryptocurrency investment market, to promote the development of cryptocurrency, the price data of the three commonly used digital currencies are used, including Bitcoin (BTC), Ethereum (ETH), and Litecoin (LTC) from September 7, 2023 to October 7, 2024. The cryptocurrency trading strategies of pairs trading, momentum trading, and grid trading which are more mature in the traditional financial market are applied to conduct investment trading analysis and comparison, explore the trading characteristics and applicability of the three trading strategies, and put forward relevant suggestions.

2. Collection and treatment of data

Following the principle of large market capitalization and good liquidity, three mainstream market cryptocurrencies, BTC, ETH, and LTC, are selected. They have large price differences and strong representativeness. The data comes from the online historical data of the Alpha Vantage API interface, and the daily price data of BTC, ETH, and LTC from September 7, 2023, to October 7, 2024, are collected. To ensure the accuracy of data analysis, the erroneous data with abnormal price fluctuations are cleaned and the data is normalized into a time series format.

The mean values of the three currencies during the observation period were 52577.16 (BTC), 2687.57 (ETH), and 73.15 (LTC). Due to the large difference in the values of the three currencies, to facilitate the observation and comparison of their swing trends in the same figure, the respective means were used for dimensionless processing. The standardized price swing trends during the observation period are shown in Fig. 1. The statistical description results are shown in Table 1, which presents the mean square deviation (Std), deviation degree (Dd), and kurtosis (Kur) indicators.

As can be seen from Fig. 1 and Table 1, overall, the prices of the three currencies showed a sharp upward trend from September 2023 to March 2024, but the volatility during the period was relatively small, while after March 2024, they showed a relatively stable downward trend, but the volatility was strong. In addition, the price in October 2024 was higher than the price in September 2023, but the price of LTC was not much different before and after. Among the three currencies, BTC's price fluctuations were the most violent, with a wide price range (maximum value of \$73066.30 and minimum value of \$25166.40). ETH also had some fluctuations, but it was more stable than BTC, and the price fluctuation range was in the middle. LTC had the smallest volatility and showed a relatively stable price trend. The kurtosis of the three currencies was less than 3, which was an abnormal flat peak distribution. The deviation degree of BTC was less than 0, which was a left-skewed peak; the deviation degree of the other two was greater than 0, which was a right-skewed peak.

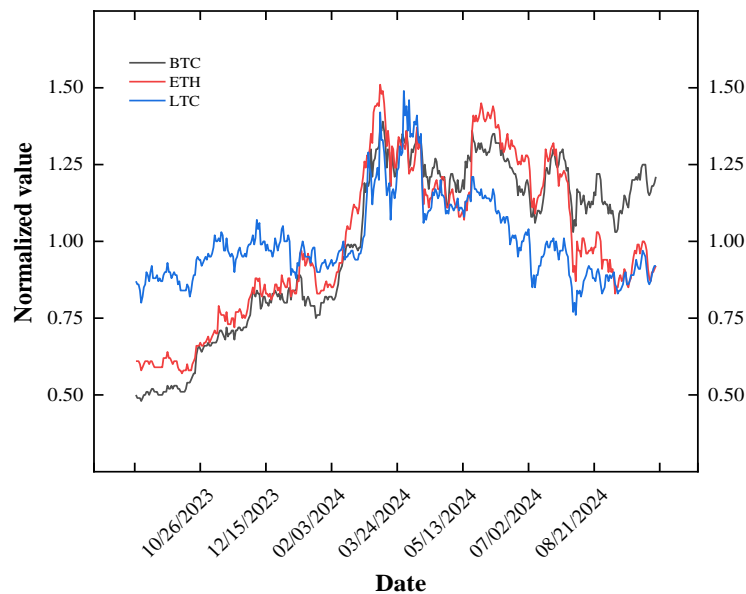


Figure 1. Fluctuation trend curves of the standardized value of daily closing prices of three types of cryptocurrency during the observation period

Table 1. Statistical description results of daily closing prices of three types of cryptocurrency during the observation period

Currency	mean	max	min	mid	Std	Dd	Kur
BTC	52577.16	73066.30	25166.40	58213.10	14221.46	-0.488	-1.142
ETH	2687.57	4065.02	1539.70	2598.90	678.62	0.037	-1.085
LTC	73.15	108.83	55.92	70.73	9.80	1.158	1.151

3. Method

3.1. Analysis method of pairs trading

Pairs trading is a classic and widely used arbitrage trading method [8] [9]. For BTC, ETH and LTC analyzed in this article, their price differences can be used to make profits by buying relatively low-priced currencies and selling relatively high-priced currencies. The volatility of the returns from pairs trading is relatively small and relatively stable. It is to find targets with highly correlated trends in the market. Generally, the price difference between the two paired currencies selected has good stability. Currently, the most used pairs trading methods are divided into distance method, cointegration test method, time series method, stochastic control method, and other methods (deep learning method, etc.). These methods have their own advantages and disadvantages, and their applicable situations are also different [9].

The cointegration test method is used here. The cointegration relationship indicates that two or more paired currencies have a common trend in the long term, which can provide theoretical support for paired trading. Its paired trading is divided into three main steps [9]:

(1) Use fundamentals or statistical indicators to select cryptocurrency pairs suitable for pairs trading;

(2) Use the EG two-step method to conduct a cointegration test to determine the cointegration relationship between cryptocurrency pairs;

(3) Use nonparametric methods to develop trading strategies, i.e., entry and departure conditions.

The following cointegration equation (Formula (1)) and residual sequence equation (Formula (2)) are required:

$$y_t = \alpha_0 + \alpha_1 x_t + \varepsilon_t \quad (1)$$

$$\varepsilon_t = y_t - \alpha_0 - \alpha_1 x_t \quad (2)$$

In the formula, α_1 the cointegration coefficient.

Trading principle. Since there is a cointegration relationship between the two targets during their formative period, that is, the residual sequence is stable and fluctuates within a certain range, when the residual sequence deviates from the long-term average price, there is a tendency to return to the mean. At this time, reversal arbitrage operations can be performed. When the residual sequence returns to near the mean, the position is closed for profit. When the residual sequence deviates significantly from the mean, stop loss is implemented [9].

Trading range. Assume that the mean and standard deviation of the residual sequence in the formative period are μ and σ respectively. The traditional trading range is determined by controlling the residuals with $\pm 0.75\sigma$ as thresholds. Due to the high volatility of cryptocurrencies, further subdivision is required. Therefore, the trading range is determined by the following method [9]:

Smaller trading range: When $\varepsilon_t \geq \mu + 0.75\sigma$, sell one unit of y and buy β units of x . When $\varepsilon_t \leq \mu$, close the position to stop winning, and when $\varepsilon_t \geq \mu + 1.5\sigma$, close the position to stop loss. When $\varepsilon_t \leq \mu - 0.75\sigma$, buy one unit of y and sell β units of x . When $\varepsilon_t \geq \mu$, close the position to stop winning, and when $\varepsilon_t \leq \mu - 1.5\sigma$, close the position to stop loss.

Smaller trading range: When $\varepsilon_t \geq \mu + 1.5\sigma$, sell one unit of y and buy β units of x . When $\varepsilon_t \leq \mu$, close the position to take profit, and when $\varepsilon_t \geq \mu + 3\sigma$, close the position to stop loss. When $\varepsilon_t \leq \mu - 1.5\sigma$, buy one unit of y and sell β units of x . When $\varepsilon_t \geq \mu$, close the position to take profit, and when $\varepsilon_t \leq \mu - 3\sigma$, close the position to stop loss.

3.2. Analysis method of momentum trading

Momentum trading is a trading strategy based on price trends. That is, when the price is in an upward trend, buy cryptocurrencies in the hope that the trend will continue and profit from it; when the price is in a downward trend, sell cryptocurrencies to achieve good returns. When applying momentum trading strategies, people use different momentum indicators to characterize the swings and trends of currency prices and use them as buy and sell trading signals, such as Bollinger Bands [5], Moving Average Convergence and Divergence (MACD), and Moving Average (MA) [10]. The comprehensive application of different momentum indicators can avoid the risks brought by market false signals and unpredictability, and enhance the accuracy of price trend prediction. This article uses MACD and Relative Strength Index (RSI) technical indicators to determine momentum trading opportunities for BTC, ETH, and LTC.

(1) MACD

The calculation formulas for the Difference (DIF) and the Difference Exponential Average (DEA) in MACD are as follows [11]:

$$DIF_x = EMA(P_x, S) - EMA(P_x, L) \quad (3)$$

$$DEA_x = EMA(DIF_x, N) \quad (4)$$

Where P_x is the closing price on the sixth day, S is the number of days of the speedy moving average convergence and divergence, and L is the number of days of the low speedy moving average convergence and divergence. The usual values of S are 12, L are 26, and N are 9.

There are many strategies that use MACD as a reference indicator. This article uses the crossover and divergence of DIF and DEA to predict price trends [11]. When $DIF > DEA > 0$, it means that the market is beginning to become strong and a more suitable buying point has appeared; when

DIF<DEA<0, it releases a signal of weakness, and at this time, you should take profit and exit to avoid risks.

(2) Void

The calculation formula of RSI is as follows [11]:

$$RS_x = \frac{meanup(P, x)}{meandown(P, x)} \quad (5)$$

$$RSI_x = 100 - \frac{100}{1 - RS_x} \quad (6)$$

In the formula, mean up represents the average increase in the period, and mean down represents the average decrease in the period. Commonly used period lengths include 6d, 12d, 24d, etc. This article uses the 14d moving average to calculate the RSI value.

The RSI value measures the overbought or oversold state of the market. Generally, an RSI value above 70 indicates an overbought state, while a value below 30 indicates an oversold state. Traders can use this signal to make buying and selling decisions [11].

3.3. Analysis method of grid trading

Grid trading is a strategy that divides the price fluctuations of the cryptocurrency market into different ranges and sets buy or sell operations within each range, thereby capturing profits by frequently buying and selling within the price fluctuation range [12, 13].

The implementation of grid trading generally includes the following steps:

First, determine the price ranges. A reasonable price range can be determined based on the highest and lowest price net values of the currency during the transaction, and then consider the acceptable risk range of 10% fluctuation. The choice of this price range is crucial. A too narrow range may lead to frequent transactions and increase transaction costs; a too wide range may not be able to effectively capture price fluctuations.

Second, divide the grid. Divide the price range into several grids. Smaller grids can capture more price fluctuations, but will also lead to more transactions and increase transaction costs. Larger grids can reduce the number of transactions, but may miss some opportunities brought by fluctuations. Therefore, the choice of grid size needs to be considered comprehensively based on the volatility of the asset, transaction costs and personal risk preferences. The specific choice is based on the price range of the cryptocurrency during the transaction and the number of grids. More grids can set more buying and selling points in the same price range, thereby better capturing opportunities brought by price fluctuations. However, the increase in the number of grids will disperse the limited initial funds too much to cover the buying operations of each grid, reducing the efficiency of capital investment. Generally, 10 to 20 grids can be considered [12].

Finally, set the buy and sell rules. The core of the grid trading strategy lies in its automated execution of buy and sell rules. Usually, when the price is above a certain grid line or below its lower line, the corresponding sell order or buy order will be automatically triggered. In this way, traders can frequently buy and sell in market fluctuations. Although grid trading aims to make profits through frequent buying and selling, it is still necessary to set stop loss and take profit levels in extreme market conditions (such as rapid price drops or increases) to control risks and lock in profits.

4. Results

4.1. Analysis of pairs trading results

BTC, ETH and LTC are the most liquid currencies in the current cryptocurrency market, with the first two ranking first and second in market capitalization respectively. To form a pair of currencies with good correlation, it is necessary to understand the correlation between the three currencies.

Fig. 1 shows that BTC and ETH fluctuate greatly, especially the price of BTC showing significant high and low differences during certain periods. If you buy when prices are low and sell when prices are high, you can simulate the effect of an arbitrage trade. BTC and ETH exhibit similar trend fluctuations, so there are potential profit opportunities in arbitrage trading for both currencies. However, the price fluctuation range of LTC during the analysis period was significantly smaller than that of BTC and ETH, and its price difference was smaller, resulting in fewer potential arbitrage opportunities. Therefore, the expected return from arbitrage trading on LTC is lower.

According to the trend chart of the three currencies during the observation period shown in Fig.1, the six months from September 7, 2023 to March 6, 2024 are selected as the formative period, and March 7, 2024 to October 7, 2024 are selected as the trading period. According to the prices of the three currencies during the formative period, the correlation between the two is analyzed. The results show that the correlation coefficients between the three paired currencies are 0.976 (BTC/ETH), 0.758 (BTC/LTC), and 0.736 (ETH/LTC), respectively. There is a strong correlation between them, especially between BTC and ETH. Therefore, the following pairing trading analysis is carried out for these three cryptocurrency pairs.

(1) Cointegration test

The unit root test results show that the ADF values of the closing price series of the three cryptocurrency pairs are all less than the critical value of 0.01, so the series can be stationary.

The cointegration test is conducted according to the EG two-step method. The three pairs of currencies are subjected to least squares regression respectively, and then six residual estimation equations are obtained according to the regression equation:

Residual Estimation Equation of BTC to ETH

$$\varepsilon_1 = BTC - 18.707ETH + 1360.065 \quad (7)$$

Residual Estimation Equation of ETH to BTC

$$\varepsilon_2 = ETH - 0.0535BTC - 170.068 \quad (8)$$

Residual Estimation Equation of BTC to LTC

$$\varepsilon_3 = BTC - 1361.218LTC + 55327.086 \quad (9)$$

The residual estimation equation of LTC to BTC

$$\varepsilon_4 = LTC - 0.000735BTC - 52.891 \quad (10)$$

Residual Estimation Equation of ETH to LTC

$$\varepsilon_5 = ETH - 68.959LTC + 2620.501 \quad (11)$$

The residual estimation equation of LTC to ETH

$$\varepsilon_6 = LTC - 0.0145ETH - 52.422 \quad (12)$$

An Augment Dickey-Fuller (ADF) test was conducted on the six residuals. The results show that the significance of the residuals ε_1 , ε_3 , and ε_5 is good. Therefore, it can be considered that BTC has a cointegration relationship with ETH, BTC with LTC, and ETH with LTC. The corresponding cointegration equation They are (7), (9), and (11) respectively.

(2) Empirical analysis

The evaluation indicators of trading performance include total return, annualized return, maximum drawdown, Sharpe ratio, number of trading, etc. These indicators are used to evaluate the quality of trading performance. The annualized risk-free rate of interest in the Sharpe ratio is represented by one-year government bond yield [9]. The value obtained by querying the China Bond Information Network is 2.08%. Opening and closing a position is counted as one transaction.

According to the trading interval division method, to facilitate the observation of the residual trend and trading relationship of the three currency pairs in the same figure, the residuals of the three currency pairs during the trading period are standardized by the residual standard deviation during the formative period (2026.35 (BTC/ETH), 6130.25 (BTC/LTC), 332.35 (ETH/LTC)), as shown in Fig. 2.

The paired trading backtest results are shown in Table 2, which respectively presents the values of indicators such as pairing (Pair), trading range (Tr), number of transactions (Ntr), annualized rate of return (Ar), maximum drawdown (Md) and Sharpe ratio (Sr).

As can be seen from Fig. 2 and Table 2, the residual sequence is relatively stable most of the time, paired trading can achieve certain results, and the asset's retracement is relatively controllable. Based on the results from various trading intervals, the analysis of the BTC/ETH pairing shows that shorter trading intervals yield a higher rate of return and a better Sharpe ratio. In contrast, for the BTC/LTC and ETH/LTC pairs, longer trading intervals result in a higher rate of return. Additionally, the Sharpe ratios for BTC/LTC and ETH/LTC are higher than that of the BTC/ETH pairing. This is mainly due to the relatively large shock range of the residual of the BTC/ETH pairing during the trading period, which has been larger in the middle and late stages. The corresponding smaller trading interval division method can better reflect the benefits brought by the residual changes in the early and mid-term. The residual fluctuation trends of the BTC/LTC and ETH/LTC pairs are very similar, except that the former shows a relatively stable trend in the later stage, while the latter shows a slight downward trend. Therefore, the annualized returns of the two are close, and the fluctuation amplitude is larger in the relatively stable stage of the residual sequence. The larger trading interval can better cover the residual sequence and obtain better returns.

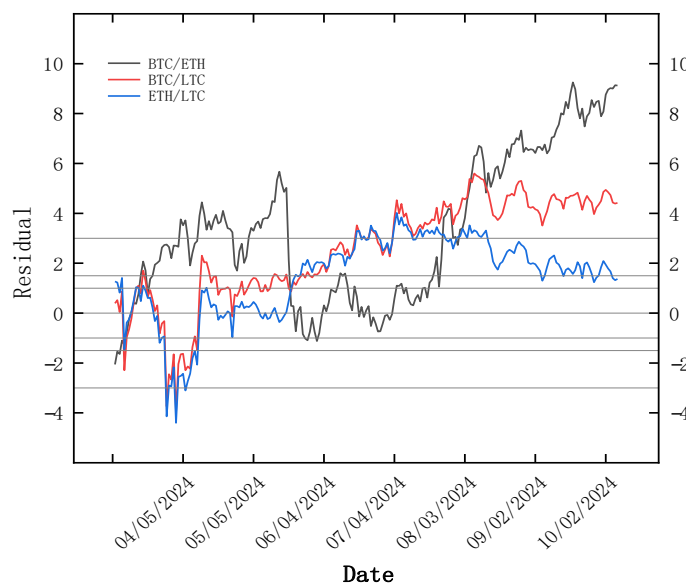


Figure 2. Fluctuation trend curves of the residual normalized value of three cryptocurrency pairs during the trading period

Table 2. Pairs trading results of three cryptocurrency pairs

pair	Tr	Ntr	Ar/%	Md/%	Sr
BTC/ETH	small	6	24.66	4.90	1.60
	large	5	7.83	10.18	0.95
BTC/LTC	small	6	23.33	14.41	1.76
	large	4	39.99	7.78	2.51
ETH/LTC	small	6	27.80	3.14	2.96
	large	4	43.43	13.02	2.52

4.2. Analysis of momentum trading results

Fig. 3, Fig. 4 and Fig. 5 respectively show the MACD, RSI and price fluctuation trends of BTC, ETH and LTC during the observation period, to intuitively present the changes of different indicators in the cryptocurrency market.

Simply based on the correlation between the MACD indicators DIF and DEA in the figure to determine the buying and selling time, the number of transactions is relatively high, but according to the RSI value trading rules, the number of transactions can be significantly reduced, reducing transaction fees, and each transaction can obtain more significant benefits. For example, BTC's RSI and MACD indicators show clear buy and sell signals during certain time periods, and momentum traders can maximize profits by seizing on these signals. For example, on June 6, 2024, DIF changed from an upward trend to a downward trend, and crossed with the upward DEA, forming a death cross (i.e., the fast line crossed below the slow line). At the same time, RSI exceeded 70, sending a strong sell signal. Currently, BTC's price is as high as 70791.5, almost reaching the peak of the observation period. Selling at this time can reap obvious benefits. On July 7, 2024, DIF turned from downward to upward, and crossed with the downward DEA, forming a golden cross (i.e., the fast line crossed the slow line). At the same time, RSI fell below 30, sending a strong buy signal. At this time, BTC's price reached as low as 55861.1, reaching the peak and trough in recent months. Buying currently has laid a good foundation for future expected profits.

The results of momentum trading analysis (Table 3) show that momentum trading does have potential in the cryptocurrency market. Due to the high volatility of BTC and ETH and the low volatility of LTC, the momentum trading strategy achieved higher annualized returns on BTC and ETH (60.86% and 75.40% respectively), while the annualized return on LTC was relatively low at 18.63%.

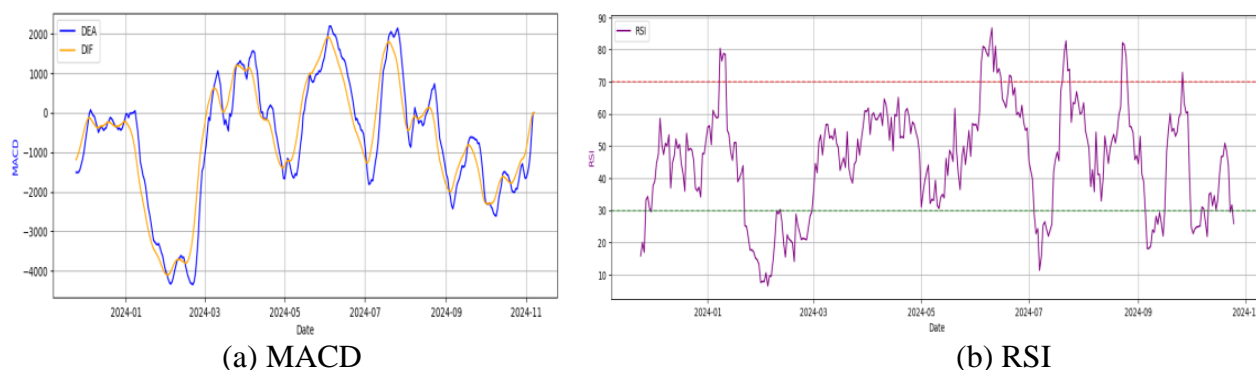


Figure 3. BTC's MACD indicator and RSI fluctuation trend curve

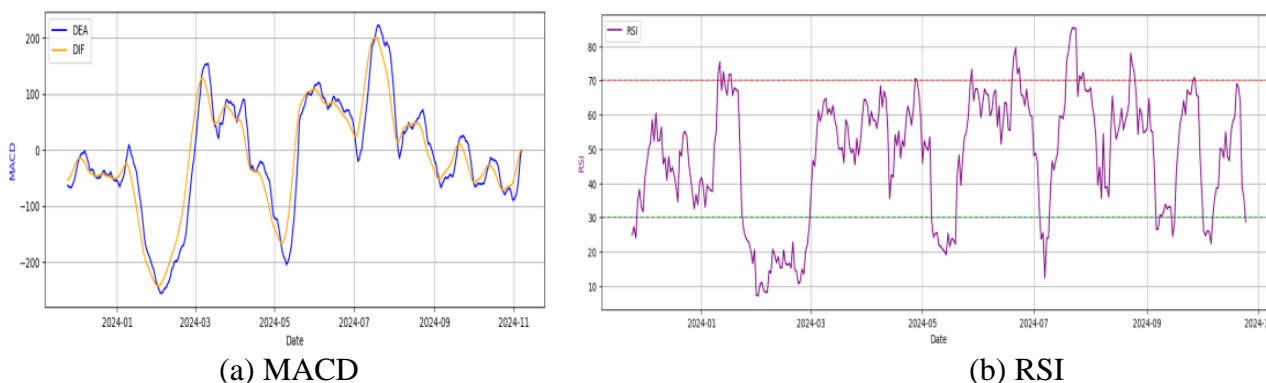


Figure 4. ETH's MACD indicator and RSI fluctuation trend curve

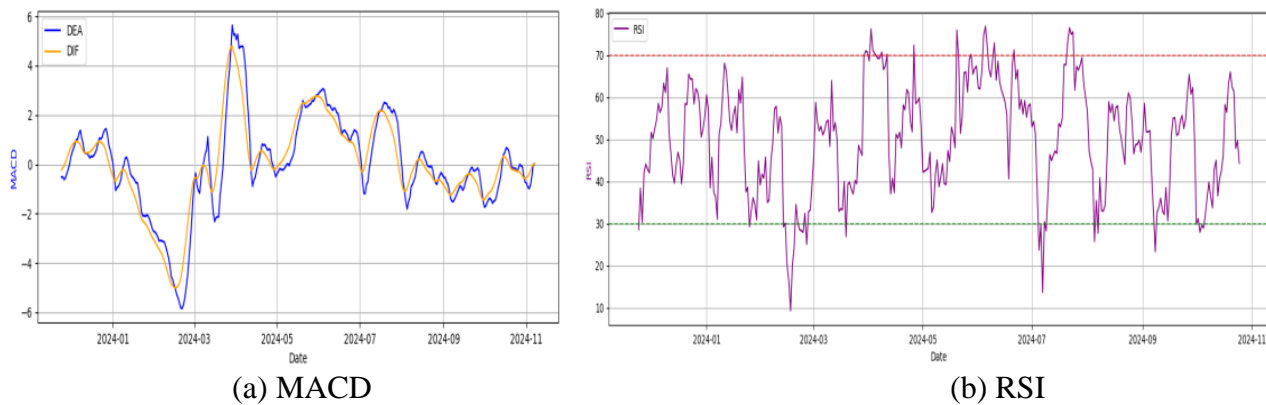


Figure 5. LTC's MACD indicator and RSI fluctuation trend curve

Table 3. Momentum trading results of three types of cryptocurrency

Cryptocurrency	Ntr	Ar/%
BTC	7	60.86
ETH	5	75.40
LTC	6	18.63

4.3. Analysis of grid trading results

When implementing a grid trading strategy, the number of grids is set downward and upward based on the initial price, maximum price, and minimum price of the trading period, taking the initial price as the benchmark and considering the rise and fall of the currency price. Conduct retest analysis on the impact of different grid numbers and sizes for the same cryptocurrency on trading frequency and returns, and compare the differences in trading frequency and returns among three cryptocurrencies under the same grid division strategy. In the retest analysis, when a currency has been bought in a grid interval, if the currency trading price is higher than the upper limit of this grid, the currency purchased in the grid interval is sold; when a grid interval is empty, if the currency trading price is lower than the lower limit of this grid, the empty funds in the grid interval are used to buy the currency.

The backtest analysis results are shown in Table 4. In the table, m1 and m2 respectively represent the number of grids set downward and upward based on the initial price. The total number of grids is $m1+m2$, and d is the grid size. The data in Table 4 shows that during the observation period, the grid trading strategy allowed traders to earn small profits from each price fluctuation through repeated sell-high and buy-low operations, resulting in significant annualized returns. Fig. 6 shows the buying and selling of ETH when the number of grids is 21. For the same cryptocurrency, when the number of grids increases and the grid range decreases, the number of transactions increases significantly, and the corresponding transaction costs increase, while the annualized the rate of return shows a trend of first decreasing and then increasing. When the number of grids increases from 9 to 21, for BTC, the annualized rate of return decreases, but for ETH and LTC, the annualized rate of return increases, indicating that for BTC with a high currency value, due to its volatility Large, to reduce frequent transaction losses, the number of grids should be controlled at around 10, and a wider grid interval should be used. For ETH and LTC with lower currency values, the number of grids should be controlled at around 20, and a narrower grid should be used. interval. For LTC, despite its overall low price and limited fluctuations, increasing the number of trading grids can significantly boost the number of transactions. For instance, when the number of grids increases from 9 to 21, the number of transactions jumps from 14 to 21, leading to a considerable rise in transaction costs. Overall, BTC has the highest annualized return, and LTC has the lowest. Therefore, based on comprehensive comparison, for low-value, limited-volatility cryptocurrencies such as LTC, grid trading strategies need to be carefully selected, and the number of grids and grid interval size need to be reasonably determined when applying them.

Table 4. Grid trading results of three types of cryptocurrency

	m1	m2	d	Ntr	Ar/%
BTC	2	7	7200	10	80.03
	4	11	5000	18	72.94
	6	15	3500	27	72.97
ETH	2	7	350	10	64.66
	4	11	250	16	59.43
	6	15	170	30	70.74
LTC	2	7	7	14	44.34
	4	11	5	23	40.34
	6	15	3	60	54.78

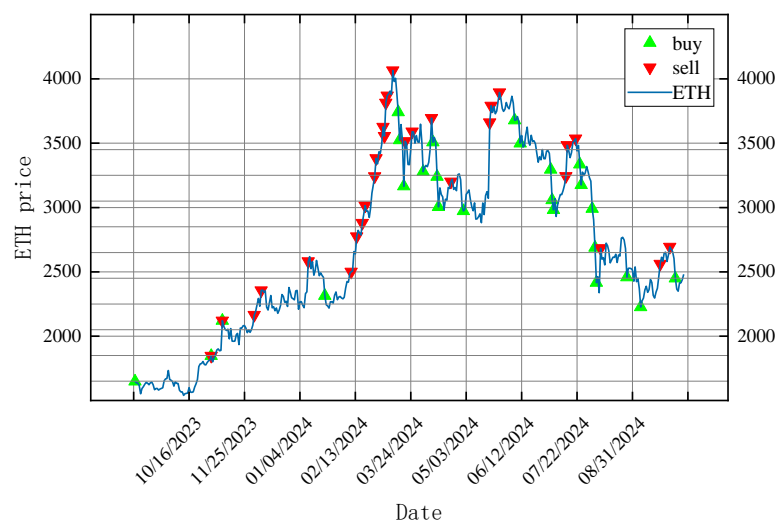


Figure 6. ETH grid trading as the number of grids is 21

5. Conclusion

This paper uses the historical price data of BTC, ETH, and LTC to explore the trading characteristics and applicability of three strategies including pairs trading, momentum trading, and grid trading in the cryptocurrency market. By comparing the application effects of the three trading strategies, the following main research conclusions can be obtained:

Pairs trading can capture risk-free returns from the price differences between currencies. First, you need to select cryptocurrency pairs with strong correlations, and then choose a reasonable trading range based on their residual volatility trends. For currency pairs with large residual volatility, it is appropriate to choose a narrower trading range; otherwise, choose a wider trading range. It is necessary to prevent losses caused by price reversals of paired currencies and delays caused by the network or platform.

(2) Momentum trading makes profits through currency price trends. The combined use of MACD and RSI indicators can effectively reduce the number of trades, minimize risks from market false signals and unpredictability, enhance the accuracy of price fluctuation trend predictions, and yield significant benefits.

(3) Grid trading is suitable for achieving stable returns in long-term volatile markets. For the same cryptocurrency, increasing the number of grids and narrowing the grid interval will significantly increase the number of transactions and transaction costs. For cryptocurrencies with high currency value and high volatility (such as BTC), the number of grids should be controlled at around 10, and a wider grid range should be used. For cryptocurrencies with lower currency values and smaller fluctuations (such as ETH), the number of grids should be controlled at around 20, and a narrower

grid range should be used. For cryptocurrencies with low currency value and limited fluctuation range (such as LTC), the grid trading strategy needs to be carefully selected, and the number of grids and grid interval size need to be reasonably determined when applying. During specific operations, the number and size of grids need to be dynamically adjusted according to market changes.

(4) The pairs trading strategy uses the price difference between different related currencies to capture trading opportunities among the three trading strategies. Its trading volatility and yield are low but relatively stable. The momentum trading strategy is applied to highly volatile cryptocurrencies and can obtain higher annualized yields. Since the grid trading strategy disperses investments in different trading ranges, it will trigger the upper and lower limits of different trading ranges during cryptocurrency price fluctuations. Therefore, its transactions are more frequent, but in the high-frequency and large-scale volatile cryptocurrency market, its returns are relatively considerable.

Each cryptocurrency trading strategy has its applicable market environment. Traders need to choose strategies reasonably according to market conditions and optimize transaction execution through automated tools and risk management methods. In future research, we can further explore strategy combinations and optimization methods based on artificial intelligence to improve trading returns.

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