

Analysis of China's A-shares Based on Industry Rotation Strategy

ZhanTuo Xing¹

¹Accounting major, Universidade de Macau

*Corresponding author. Email: bb90613@umac.mo

ABSTRACT

Industry rotation is a common phenomenon in the stock market. Through the idea of momentum and reversal trading, this paper uses the CSI 300 industry index to empirically test the industry rotation phenomenon of China's A-share market. The results of the trading test reflect that the industry momentum phenomenon of my country's A-share market is quite evident in the daily and monthly time intervals. In contrast, in the weekly time interval, it is a periodic industry rotation and momentum phenomenon. To a certain extent, the research results confirm the short-term and particularity of the industry rotation phenomenon in my country's A-share market. In addition, it also has specific reference significance for investors' investment practice.

Keywords: stock market; industry rotation; reversal trading; momentum trading

1. INTRODUCTION

Industrial rotation has become a hot topic both in economics and in finance as it is a common phenomenon in the stock market. Industry rotation is a type of sector phenomenon, which refers to the phenomenon that stocks of different industries in the stock market show alternate rises or falls, that is, the so-called "rotation". There are various reasons for industry rotation, which may come from technical factors or fundamental factors. Sequeira, J. M. applied behavioral finance theory to demonstrate that this industrial rotation phenomenon was unique in market speculation [1]. Grauer, R. R. uses the relevant cointegration theory to explore the equilibrium relationship between stock prices and market indexes, studies the dynamic adjustment process of securities market prices, and finds a phenomenon of "sector rotation" in China's securities market [4]. In addition, some scholars have used econometric methods to analyze the industry rotation phenomenon from the perspectives of the correlation of returns between industries and the transmission mechanism. In this article, the author selects industry index returns as the test object and use momentum and reversal trading strategies to analyze the industry rotation phenomenon in China's A-share market. Specifically, this paper selects the daily, weekly, and monthly CSI 300 industry index returns for empirical research. From this empirical research, it is believed that

the industry rotation phenomenon of China's A-share market is different from the traditional macro-level phenomenon, caused by short-term speculative factors at the technical and capital levels.

2. THE PHENOMENON OF INDUSTRY ROTATION

In the stock market, an industry refers to a collection of stocks of companies operating the same or similar businesses. Due to the influence of economic factors such as macroeconomics and industries, the business prospects of companies in the same industry are highly correlated with changes in earnings. Therefore, stock prices in the same industry or sector often rise and fall at the same time. Industry rotation is a type of sector phenomenon, which refers to the phenomenon that stocks of different industries in the stock market show alternate rises or falls, that is, the so-called "rotation". There are various reasons for industry rotation, which may come from technical factors or fundamental factors. For example, the news of a company's merger and acquisition has caused a large number of buy orders in the market. This could be seen by the market as a signal of future upside prospects for the sector's stocks, leading to a massive inflow of capital that in turn propels the entire sector higher. Fundamental factors can also lead to industry rotation, such as adjustments in fiscal and monetary policies, the emergence of new technologies, and changes in the economic environment.

Institutions and scholars at home and abroad have conducted many studies on the phenomenon of industry rotation. In a 2004 report, Merrill Lynch used the concept of an investment clock to analyze the reasons for industry rotation from the perspective of the economic cycle. He introduced some indicative indicators to determine the economic cycle and industry rotation. Sequeira, J. M. provided several quantitative indicators to reflect the sector's strength, applied behavioral finance theory to analyze the sector rotation of the stock market, and believed that the sector rotation phenomenon of the stock market was a unique phenomenon of market speculation [1]. Conover et al. analyzed the relationship between monetary policy and industry rotation using the data of the U.S. stock market from 1973 to 2005 and believed that stocks with solid cyclicalities should be selected in a loose monetary environment and should be selected in a tight economic environment [2]. Using data from 41 Fidelity industry-specific funds from January 1998 to September 2003, Sasseti and Tani found that industry rotation strategies consistently beat buy and hold plans. In addition, some scholars have used econometric methods to analyze the industry rotation phenomenon from the perspectives of the correlation of returns between industries and the transmission mechanism. Li used the return correlation coefficient and Granger non-causality test to study the industry rotation phenomenon in the Australian stock market [3]. Grauer, R. R. uses the relevant cointegration theory to explore the equilibrium relationship between stock prices and market indexes, studies the dynamic adjustment process of securities market prices, and finds a phenomenon of "sector rotation" in China's securities market [4].

This paper uses the reversal trading strategy to empirically test the industry rotation phenomenon in China's A-share market and analyze possible reasons. On the one hand, the results we obtained are helpful to analyze the industry rotation phenomenon of the A-share market from a new perspective. On the other hand, we hope to inspire investors' trading practices.

3. TRADING STRATEGY AND DATA

Many studies have shown that there are predictable parts of stock price return data, among which trend following and mean reversion are more common. Scholars have found that momentum and reversal trading strategies can obtain excess returns [5]. Momentum trading assumes that stock returns will continue the trend of the previous period. If the price of the last period has risen more, choose to buy; if the last period's price has fallen more, decide to sell. On the other hand, Reversal trading believes that a stock's return will trend toward a long-term trend, buying when prices are falling more and selling when prices are rising more. Some domestic scholars have used momentum and reversal trading strategies to conduct relevant empirical research on the A-share market.

In this article, I select industry index returns as the test object and use momentum and reversal trading strategies to analyze the industry rotation phenomenon in my country's A-share market. The combination of momentum and reversal strategies and industry indexes reflects the ups and downs of different industries and implies the idea of industry rotation. Specifically, the trading strategy adopted in this article is as follows:

If you choose a reversal trading strategy, then for given N security, select the securities that were relatively weaker than the market portfolio in the previous period to form a "loser portfolio," which constitutes the extended position of the strategy, and at the same time select the securities that were relatively stronger than the market portfolio in the previous period. Stakes make up a "winner's portfolio" that makes up the strategy's shorts, forming a portfolio. Positions are adjusted for each trading period based on the market performance of the previous period. Among them, the weight $w_{i,t}$ of security i in the portfolio in the t-th trading period is determined by its strength relative to the average market return in the previous trading period:

$$w_{i,t} = \frac{R_{i,t-1} - R_{m,t-1}}{\sum (R_{i,t-1} - R_{m,t-1})^+}; R_{m,t-1} = \frac{1}{N} \sum_{i=1}^N R_{i,t-1}$$

Among them, $R_{i,t}$ is the yield of security i in the t-th trading period, and $R_{m,t-1}$ is the market return, the average yield of N securities. From the weight setting of the strategy, it can be seen that the trading strategy is an inverse volume trading strategy, and the weight of securities in the investment portfolio of each trading period is related to the excess return of the previous period. If a momentum trading strategy is used, the weights are determined oppositely:

$$w_{i,t} = \frac{R_{i,t-1} - R_{m,t-1}}{\sum (R_{i,t-1} - R_{m,t-1})^+}$$

During each trading period, the long and short positions held by the portfolio are completely offset, as we can see from the following formula:

$$\sum_{i=1}^N w_{i,t} = \frac{\sum_{i=1}^N R_{i,t-1} - N * R_{m,t-1}}{\sum (R_{i,t-1} - R_{m,t-1})^+} = 0$$

Therefore, the trading strategy in this article is a market-neutral trading strategy, where long and short positions are hedged against each other, and the strategy holds a net work of 0. In actual investment, the real return of a market-neutral plan depends on the leverage ratio in the investment. Because margin financing and securities lending transactions often require a certain margin ratio, and investors will also adjust their leverage ratio from the

perspective of risk control, it is theoretically difficult to calculate the rate of return of the strategy. In this paper, the trading positions are normalized for the convenience of calculation.

When calculating the return of the strategy, we subtract the return of each period from the return of the short of obtaining the total return of the process. If the reversal strategy can continue to receive significant positive returns, it means that there is a rotation phenomenon of alternating rising among industry indices; if the reversal strategy can continue to obtain substantial negative returns, it means that the momentum strategy can receive positive returns, and the industry trend of the index shows momentum. If the process cannot continuously accept significant non-zero returns, the trading strategy in this article cannot find the sector phenomenon of the industry index.

This paper selects the daily, weekly, and monthly CSI 300 industry index returns for empirical research.

4. STRATEGIC EMPIRICAL TEST RESULTS AND ANALYSIS

4.1 Strategy test results

First of all, without considering the transaction cost, it is found through testing that the application of reversal trading has tested the data of three periods. The daily and monthly data tests have suffered losses, while the weekly data tests can be profitable. Therefore, this paper uses momentum trading strategies for daily and monthly data instead. Table 2 lists the three sets of data testing of the trading strategy without transaction costs to obtain the return statistics, in which the daily data and monthly data adopt the momentum strategy, the weekly data adopts the reversal strategy, and the mean and standard deviation are based on their respective Period calculation. Cumulative returns are calculated by accumulating portfolio returns in each trading period.

Suppose you look at the full report of the trading strategy. In that case, the daily and monthly data use the momentum strategy, and the weekly data adopts the reversal strategy to profit. It shows that there is momentum among industry indices in terms of days and months. At the same time, there is a reversal phenomenon in weekly cycles, that is, the phenomenon of inter-industry rotation. If looking at the mean and standard deviation of the strategy returns, the mean of the strategy returns is positive, indicating that a positive return has been achieved. Still, the norm is much smaller than the standard deviation, and the return is not significantly greater than 0 in a statistical sense.

Table 1. Strategy test

	Monthly data	Weekly data	Daily data
mean rate of return	1.08%	0.15%	0.26%
Standard Deviation	4.92%	2.5%	1.11%
Cumulative Return	148.41%	72.59%	13894.36%

4.2 Risk factor analysis

In this paper, we select industry index returns as the test object and try to use momentum and reversal trading strategies to analyze the industry rotation phenomenon in China's A-share market.

Risk attribution analysis was performed using the Fama-French three-factor model. The three-factor model is an analytical model established by American economists Fama and French for the small-cap stock effect and other market anomalies in the stock market. The risk and reward of portfolio returns are well explained. The three-factor model is set as:

$$R_p - r_i = a + b * (R_M - r_r) + SMB + h * HML + e$$

The scale factor SMB refers to the difference in returns of small-cap stocks relative to large-cap stocks, while HML is the difference between stocks with high book-to-value ratios and stocks with low book-to-value ratios. The results of the three-factor model analysis are shown in Table 4, with the standard deviation of the estimates in parentheses. The adjusted R2 values of the three sets of regression analysis are relatively small, indicating that the model's factors cannot explain the return of the strategy. Among them, the estimated values of market factors, SMB and HML in the three sets of regression analysis show that they have little impact on the strategy return. The estimated weight and standard deviation of a monthly strategy and the daily strategy can obtain excess returns, while the weekly approach has a lower significance.

From the analysis of Fama-French's three-factor model, the industry rotation strategy of momentum and reversal trading in this paper can obtain excess returns daily and monthly time scales. Still, the excess returns are not significant in the weekly data test. In addition, the three groups of strategies all show the characteristics of market-neutral trading strategies, and the correlation between strategy returns and market factors is low.

Table 2. Three-factor model analysis results

	a	Rm-rf	SMB	HML	Adjusted R2
monthly strategy	0.784% (0.518%)	0.1128 (0.0519)	-0.1689 (0.1190)	-0.2734 (0.1795)	3.7%
Weekly strategy	0.048% (0.597%)	0.0282 (0.0600)	0.3007 (0.1376)	0.0063 (0.2079)	2.6%
day strategy	5.466% (0.557%)	-0.1024 (0.0600)	-0.1471 (0.1284)	0.1579 (0.1940)	2.9%

5. CONCLUSION

This paper studies the industry rotation phenomenon of the A-share market, analyzes the CSI 300 industry index with the reversal trading strategy, find the momentum phenomenon of the industry index with the period of day and month, and finds the stage with the period of the week. From the results of the trading test, we can see that the industry rotation and momentum in a short period are more prominent. It is believed that the industry rotation phenomenon of China's A-share market is different from the traditional macro-level phenomenon, which may also come from short-term speculative factors at the technical and capital levels.

REFERENCES

- [1] Sequeira, J. M. (2021). Monetary policy surprises, stock returns, and financial and liquidity constraints, in an exchange rate monetary policy system. *Quarterly Review of Economics & Finance*, 81, 226–236.
- [2] Mitchell Conover, Gerald Jensen, Robert Johnson, Jeffrey Mercer(2008). Sector Rotation and Monetary Conditions:*Journal of Investing*, 17, 34-46.
- [3] Eric Li (2004). Testing Sector Rotation in the Australian Share Market:*Review of Social Economic and Business Studies*, 14(2) 99-115.
- [4] Grauer, R. R. (2008). On the Predictability of Stock Market Returns: Evidence from Industry-Rotation Strategies. *Journal of Business & Management*, 14(2), 149–173.
- [5] De BOND, W. F. M., & THALER, R. (1985). Does the Stock Market Overreact? *Journal of Finance* (Wiley-Blackwell), 40(3), 793–805.