An Empirical Research Based on The Industry Momentum Effect in China's Stock Market

Zhifeng Li[1, a]

[1]International school, Jinan University, Guangzhou, Guangdong Province, 511436, China

[a]Corresponding Author's Email: lzfssg123@stu2021.jnu.edu.cn

Abstract

The industry momentum effect refers to the trend that the industry's yield continues the original historical direction of movement, that is, the industry with high yield in the past will still maintain high yield in Brunei, while the industry with low yield in the past will continue to maintain low yield in the future. The trend of this return rate is of great significance to the construction of investment and trading strategies, but the research on the momentum of China's story industry is still lacking. This paper conducts an empirical test on whether there is industry momentum effect in China's A-share market.

Keywords

Momentum effect; Industry momentum; Industry Momentum Trading Strategies; China stock market.

1. Introduction

The traditional efficient market hypothesis theory achieved great success from the sixty to the 70s of the last century. However, with the continuous development of the times and the financial market, the efficient market hypothesis is more and more challenged by the academic and practical circles. One is about how to test this theory. If you want to test the EMH theory reasonably, you must combine it with the asset pricing model. However, the asset base price theory is difficult to be tested through various models or practices. The second is that the theory of efficient market hypothesis takes rational participants as the premise, and regards the decision-making behavior of investors as a simple pursuit of maximizing interests, which ignores the irrational factors in the decision-making process of investors in reality. Third, in recent years, a large number of empirical studies have found a series of abnormal phenomena that are inconsistent with the efficient market hypothesis theory. And in the family of this abnormal phenomenon, the momentum effect is widely concerned.

2. Industry Momentum Effect Mechanism

The industry momentum effect refers to the performance of the industry index return rate has a certain historical trend, that is, the industry with outstanding performance in the past will still maintain a high return rate in the next period of time. Moskowitz and Grinblatt (1999) explored the returns from a strategy of buying firms in industries that were winners over a past ranking period and shorting an equal dollar amount of firms in the loser industries. They concluded that momentum effects are mainly driven by industry factors and show that the profitability of individual stock momentum strategies could be largely explained by industry momentum [1]. According to the conclusion of Moskowitz and Grinblatt, we can buy the stock portfolio of the industry with excellent yield in the near future, and sell the industry stock portfolio with poor yield in the near future. Through this portfolio, we can predict the yield of a single stock based on the performance of the industry momentum, so as to obtain excess

earnings. This trading strategy constructed by using the industry momentum effect is called the industry momentum trading strategy.

2.1. The Current Dispute on Momentum Effect

The existence of industry momentum in the stock market is a widely acknowledged phenomenon witnessed by the widespread examination. Giannikos and Ji urnish evidence showing that industry momentum payoffs exist in some other countries outside the US [4]. In the previous few years when the momentum effect was just discovered, foreign scholars mainly focused on studying whether the momentum effect is a real so-called market anomaly, that is, they are mainly committed to studying the existence of momentum effect from a single market. With the deepening of the research, foreign scholars basically reached an agreement that momentum effect is real and cannot be explained by the original theory or hypothesis [2]. At present, there is no final conclusion on the cause of momentum effect in the academic community. In the academic circles, some people think that momentum effect is only the result of data mining, and some people think that only when it can sell short and the transaction cost is zero, the momentum trading strategy can get the excess income. If the reality is often that the momentum investment strategy needs frequent position changes, the transaction cost will be at a high level because of frequent operations. It will even exceed the benefits of momentum trading strategy.

3. Research Framework

This study will be divided into the following three parts:

The first part is the construction of the model. This study is based on the yield data of every 6 representative stocks in 31 primary industries in China's A-share market from January 1, 2008 to December 31, 2,017 for nearly 10 years, and uses the methods of Jegadeesh and Titman to build the industry's "winner portfolio" and industry's "loser portfolio", and choose different observation periods and holding periods to study the actual effect of industry momentum. The second part is the empirical analysis of the industry momentum effect. According to the two cases of whether the transaction cost is considered or not, this study conducts a multi-level analysis of the industry's "winner portfolio" and industry's "loser portfolio" in different observation periods and holding periods, and tests whether it can obtain the excess return relative to the industry's average return rate, as well as the significance of the ability to obtain this excess return. The third part, conclusion and analysis. After the detailed processing and analysis of the data, this study will summarize the empirical conclusions and shortcomings based on the results of the experiment, and point out the research direction for further research.

4. The Construction of Research Model

4.1. Sample Data

Considering the uniqueness and particularity of China's stock market, this study first needs to classify the stocks in China's A share market according to their industry. In this paper, the author uses the industry classification standards of the China Securities Regulatory Commission.

On this basis, in order to ensure that the sample data is representative, and has a certain number of basis, and in consideration of the impact of the reform of shares and shares on the overall results, the original data range of this study is from January 1, 2008 to December 31, 2,017, with a total of 373 weeks of stock price data for 10 years. The data used in this paper are all from the CSMAR database.

4.2.　The Construction of "Winner Combination" and "Loser Combination"

This study refers to the ten-digit method used by Jegadeesh and Titman Research Institute to establish the "winner portfolio" and "loser portfolio". This study uses the research methods of Jegadeesh and Titman for reference, considering the particularity of the sample data selection in this study and the industry classification standard of the CSRC, this study sorted every 6 representative stocks in the 31 selected industries, and the industries with the top 3 yield rate as the industry "loser portfolio", and the industries with the bottom 3 yield rate as the industry "loser portfolio".

4.3.　The Choice of Time Interval

In the relevant studies of momentum effect, the time interval selection of observation period and holding period has always been a key parameter setting. Different studies often lead to different results because of the differences in the time interval selection of data. In order to make the research more accurate, this study will set the observation period and the time interval of the holding period to be set to 1 to 37 weeks (9 months) and other interval. For the selection of this time interval, we consider the previous research test, and let the research interval cover the time interval with significant momentum effect in previous scholars' relevant research, so that the data of observation period and holding period are more accurate.

4.4.　Data Processing

The data processing of this study will be divided into the following steps: first, select a specific length of time interval as the observation period of the industry stock portfolio, recorded as J, at the same time, calculate the return rate of each industry index in this observation period, recorded as $RJ_{i,t}$. The second is to sort the individual stock yield in the observation period according to the level, and build the industry's "winner portfolio" and industry's "loser portfolio", recorded as W and L respectively. Third, after the observation period, a certain length of time interval is selected as the holding period of the portfolio, which is recorded as K, and then during the holding period, the return rate of the industry's "winner portfolio" and the industry's "loser portfolio" are calculated respectively, which are recorded as $R^K_{W,t}$ and $R^K_{L,t}$ respectively. Fourth, after a period of time, repeat the above 3 steps, because in different observation periods, the ranking of the return rate of each stock will change, and it is necessary to readjust the industry's "winner portfolio" and industry's "loser portfolio", that is, rolling adjustment of the winner portfolio and loser portfolio.

The calculation of the yield rate:

The calculation of the stock return rate, this study takes the stock price as an indicator, and the formula of the return rate is:

$$R = \frac{S_t - S_{t-1}}{S_{t-1}}$$

The average calculation of the return rate of the industry "winner portfolio" and the industry "loser portfolio" during the holding period is recorded as AR^K_W and AR^K_L, and the calculation formula is:

$$AR^K_j = \frac{1}{T}\sum_{t=1}^{T} R^K_j, j = W, L$$

Calculate the average value of momentum trading strategy, recorded as $AR_{J,K}$, and the calculation formula is:

$$AR_{J,K} = AR_W^K + AR_L^K$$

Finally, use T to test whether ARJ and K are significantly equal to zero. If ARJ and K are significantly greater than zero, then we think there is a momentum effect. If ARJ and K are significantly less than zero, then we think there is a reversal effect.

As for the details of data processing, whether it's the yield of the industry's "winner portfolio" or the industry's "loser portfolio", this study calculates the weekly average yield, and takes the weekly average yield as the basic unit for sorting and subsequent calculation.

5. An empirical Analysis of the Momentum Effect of the Industry

5.1. Data Processing of Various Combinations

In this section, this study will use the above-mentioned relevant industry yield data and the constructed model to conduct empirical research on the momentum effect of various industries in 31 primary industry plates in China's A share market. The indicators of the industry momentum effect are based on the change of the yield rate of 6 representative stocks in the industry. It is worth noting that in order to simplify the calculation, this study ignored the impact of transaction costs on the momentum effect of the industry.

5.2. An analysis of the Profit Characteristics of Winners' Industry Portfolio

In this study, the excess return of the winner's portfolio will increase with the holding period, showing a trend of decreasing first and increasing later. When the observation period and holding period are within the first 3 months, it is often able to obtain significant excess return, and generally speaking, the highest return that can be obtained is generally in the observation period and the holding period is 1 month; When the time interval between the observation period and the holding period is 4 months to 8 months, the performance of the momentum strategy portfolio is not good, and there are often negative returns, but with the increase of the holding period, the excess return rate will change from a large fluctuation to a more stable one. It is worth noting that the excess return and the observation period also show a trend of decreasing first and then increasing, but on the whole, the volatility of the portfolio return rate will be weaker than the change of the holding period.

5.3. An Analysis of the Profit Characteristics of the Loser Industry Portfolio

In this study, most of the strategic portfolios selling the industry's "loser portfolio" can't obtain excess earnings. When the observation period and the holding period are less than 3 months, the overall trend of the loser portfolio and the winner portfolio is basically the same, and when the observation period and the holding period are 1 month, it can reach the maximum; After that, with the increasing holding period, the excess return will not only decrease. When the observation period and holding period are 3 months to 8 months, the portfolio can achieve a stable negative return rate, but different from the winner portfolio, after 8 months, the excess return rate of the loser portfolio will drop sharply, showing a significant reversal effect.

6. Conclusion

Based on the efficient market hypothesis theory, this paper conducts an empirical test and analysis of the industry momentum effect of China's A-share market, and judges whether it can obtain A significant excess return. The results show that: the industry momentum effect has a significant effect when the observation period and holding period are less than 3 months. Among them, when the observation period and holding period are 2 weeks respectively, it can obtain a higher excess return; The reversal effect of the industry is more significant after the holding period is 4 months, and the performance of the strategy portfolio is poor, often with

negative returns; The industry momentum strategy constructed by long "winner portfolio" and short "loser portfolio" can obtain significant excess earnings in the observation period and holding period within 3 months.

References

[1] Klaus Grobys, Joni Ruotsalainen, Janne Äijö. (2017) Risk-managed industry momentum and momentum crashes, 18(10): 1-2. DOI: http://dx.doi.org/10.2139/ssrn.2903989

[2] Chen Zhigang. (2011) An Empirical Study on the Industry Momentum effect of China's A-Share Market, Graduate Thesis of South China University of Technology, 12: 1-3.

[3] Xie Linmin(2016) An Empirical Study of industry momentum effect in China's A-share market, Graduate Thesis of Fudan University, 2: 18-19.

[4] Zeyuan Song, Xiaomin Gong, Changrui Yu, Zhuoran Liu (2021) Abnormal Synthetic Attention, Market States, and Industry Momentum: Evidence from China, Engineering Letters, 29(2): 1-3.