

# The Study of the Momentum Effect and the Reversal Effect on the Chinese Stock Market

——Based on the Data of Chinese A-Share Market

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## **Abstract**

Momentum and reversal investment strategy are based on cross trade mechanism, which was not available until April, 2010 in China. Since then, countless papers in this area have benefited from a mass amount of data. Using the stock market data since April 2010, this paper sets focus on the existence of the momentum effect and reversal effect on Chinese stock market. From the empirical research results, we find that there exist the short-term momentum effect and the mid-term reversal effect on Chinese stock market. Based on the BSV model, this paper makes an effective explanation of the momentum and reversal effect on Chinese stock market.

**Key words:** *momentum effect; reverse effect; BSV model; HS model; Chinese A-share market*

## **1 Introduction**

Since the 1990s, many scholars have done empirical researches on the momentum and reversal effect of the international capital market, most of which showed that reversal strategy and momentum strategy could get excess returns. For the domestic stock market, researches also demonstrated that the momentum effect and reversal effect exist. Base on the hypothesis that the short selling mechanism exists, much studies of the domestic market were pushed. However, until April 2010 when China came to do some margin trading and the stock index futures trading, short selling mechanism emerged in China. Therefore, this article contributes to exploration of existence of the momentum effect and reversal effect on Chinese stock market and tries to explain it after the presence of short-selling mechanism.

The first time that the reversal effect on foreign securities market was found out was in 1985, De Bondt and Thaler<sup>1</sup> built the winner portfolio and loser portfolio using the nyse stock trading data as sample, and then constructed the momentum strategy combinations and inversion strategy combinations for research. Finally, they found that the reversal strategy combinations can produce positive excess returns, which also proved that there was a reversal effect on the stock market. Jagadeesh and Titman<sup>2</sup> officially launched the concept of momentum effect in 1993, the methods by which Jagadeesh and Titman found the momentum effect are basically adapted by the later researchers, the two scholars' study found that the mid-term momentum effect existed in the U.S stock market. Since then, Since then, on the basis of Jagadeesh and

Titman, two pioneer in the area of the momentum effect, many scholars, considering the stock market cycle<sup>3</sup>, the transaction costs<sup>4</sup> and the stock market scale factors<sup>5</sup>, study the momentum and reversal effect.

Compared with foreign research, domestic research for the momentum and reversal effect started relatively late. The research methods mainly draw lessons from foreign research methods<sup>6</sup>, primarily focusing on the existence of the momentum and reversal effect. In addition, compared with the studies abroad, the domestic studies often put the momentum effect and the reversal effect together.

## 2 Research design

### 2.1 Samples and data

The data of this paper is derived from Wind database.

The research object of this paper is A-share stock market in China, the sample is eligible A-share stocks from April 1, 2010 to February 29, 2016, a total of 554 pieces. The sample interval is April 1, 2010 to February 29, 2016, a total of 71 months. Choosing samples of stock, we exclude the stocks whose trading data is incomplete as well as ST, S \* ST shares, weed out stocks without trading data more than a month and delete the yield of every stock listed in the first month.

### 2.2 Research methods and test

#### 2.2.1 Research methods

Using the research methods of Jegadeesh and Titman (1993) in this literature.

Respectively, setting the formation time J and holding time K are respectively at 1 month, 2 months, 3 months, 6 months, 9 months, 12 months, forms 36 (J, K) combinations occurs. From 36 (J, K) combinations, arranged in an ascending order based on its cumulative rate of return in the past month J, selecting the last 10 percent as WP (winner portfolio) combination, and the top 10 percent as LP (loser portfolio), we build a zero-cost momentum combination namely WP-LP. Each stock of the portfolio getting weighted average by the market value, so we get three combinations including WP, LP, WP-LP. Using overlap sampling method consistent with that of Jegadeesh and Titman, we can avoid missing data information.

The cumulative rate of return can be calculated as follows:

(1) Assuming that the monthly income rate of the stock i in month t is  $R_{it}$ , the proportion that stock i accounts for total market value of equity portfolio is  $\beta_i$ , the number of stocks in the winner or loser portfolio is n;

(2) The cumulative return of stock i in the formation J,  $ARR_{Ji} = \prod_{t=1}^J (1 + R_{it}) - 1$ ;

(3) The cumulative return of stock i in the holding period K,  $ARR_{Ki} = \prod_{t=1}^{J+K} (1 + R_{it}) - 1$ ;

(4) The cumulative return of winner combination WP in the holding period K,  $ARR_{WP} = \sum_{i=1}^n ARR_{Ki} \times \beta_i$

(5) The cumulative return of loser combination LP in the holding period K,  $ARR_{LP} = \sum_{i=1}^n ARR_{Ki} \times \beta_i$ ;

(6) The cumulative return of zero-cost investment strategy WP-LP in the holding period K,  $ARR_{WP-LP} = ARR_{WP} - ARR_{LP}$

### 2.3 Statistical test

Under the assumption that the cumulative return of zero-cost investment strategy is normally distributed, we can do t-test for the cumulative rate of return of the WP-LP combination.

$$H_0 : ARR_{WP-LP} = 0$$

It is the null hypothesis that the zero-cost combination does not exist excess return.

$$H_1 : ARR_{WP-LP} \neq 0$$

It is the alternative hypothesis that the zero-cost combination exists excess return.

If the t-test result is significantly positive, there exists a momentum effect on the market, and the excess return rate of zero-cost portfolio is positive; otherwise, the excess return rate of zero-cost portfolio is negative, there exists a reversal effect.

### 3 Empirical analysis

In this study, the momentum and reversal effects are tested in the entire time interval for the sample, the empirical results of this paper will be respectively depicted in this section. The empirical results are as follows:

Table 1- Entire time interval empirical results

( J , K )		K=1	K=2	K=3	K=6	K=9	K=12
J=1	WP	0.008814	0.009314	0.021719	0.050107	0.053444	0.095299
	LP	-0.00243	0.00234	0.010084	0.03152	0.066534	0.108191
	WP-LP	0.01124***	0.00697	0.01164	0.01859	-0.01309**	-0.012892
J=2	WP	0.009401	0.020183	0.033181	0.056229	0.053747	0.102947
	LP	0.002466	0.010897	0.019826	0.04118	0.082747	0.125372
	WP-LP	0.00694***	0.00929	0.01336	0.01505	-0.028999**	-0.022425***
J=3	WP	0.011759	0.020906	0.041205	0.046063	0.061221	0.113692
	LP	0.003291	0.012094	0.014194	0.035052	0.080072	0.118268
	WP-LP	0.00847**	0.00881	0.02701	0.01101	-0.018851***	-0.004576***
J=6	WP	0.01148	0.014337	0.02408	0.016369	0.032858	0.077987
	LP	-0.00608	-0.01097	-0.00814	0.006079	0.050384	0.080828
	WP-LP	0.01756**	0.02531**	0.03222	0.01029	-0.017526**	-0.002841
J=9	WP	0.006912	0.008774	0.017279	0.010812	0.042704	0.090065
	LP	-0.00227	-0.00857	-0.00806	0.002183	0.042478	0.089488
	WP-LP	0.00919	0.01734	0.02534*	0.00863	0.00023	0.00058
J=12	WP	0.003141	0.005121	0.012114	0.026447	0.056083	0.106999
	LP	-0.0051	-0.01001	-0.00875	-0.00067	0.042285	0.099619
	WP-LP	0.00824	0.01513	0.02087	0.02712	0.0138	0.00738

(1) In “Table 1”, values represent the cumulative rate of return; \*, \*\*, \*\*\* represent statistical significance at the confidence level of 10%, 5% ,1%. As shown in “Table 1”,

generally speaking, there exists a clear momentum effect in Chinese A-share market, but the reversal effect emerges only when the holding period is 9 months or 12 months. Among these 36 combinations, there is a clear momentum effect in combinations (1,1), (2,1), (3,1), (6,1), (6,2), (9,3), and a significant reversal effect in combinations (1,9), (2,9), (2,12), (3,9), (6,9), (3,12). According to them, the combination made with maximum momentum earnings and statistical significance is (9,3), whose portfolio return reach to 0.02534 in the holding period; The combination made with maximum reversal gains and statistical significant is (2,9), whose portfolio return in the holding period arrived at 0.028999.

Specifically, there are six combinations with significant momentum effect, four occur in holding period of 1 month and two occur in holding period of 2 months or 3 months. As to Significance, holding period of 1 month is highest. Therefore, we think the momentum effect occurred mainly in short-term holding period. Combinations with significant reversal effect gather in the holding period of 9 months and 12 months, so we argue that the reversal effects mainly occurred in the mid-term holding period.

(2 ) From the above analysis, the momentum and reversal effect change with the formation and holding period. “Fig. 1” describes the situation where the cumulative excess return of combination changes with the holding period in different formation period. From “Fig. 1”, for all formation period, when the holding period is less than six months, the cumulative rate of return is greater than 0, which indicates, when the holding period is less than six months, there is a momentum effect, and exclude the formation of 9 months and 12 months. When the holding period is greater than six months, the cumulative excess return of combinations in other different formation is less than 0, which verifies that when the holding period is more than six months, there is a reversal effect.

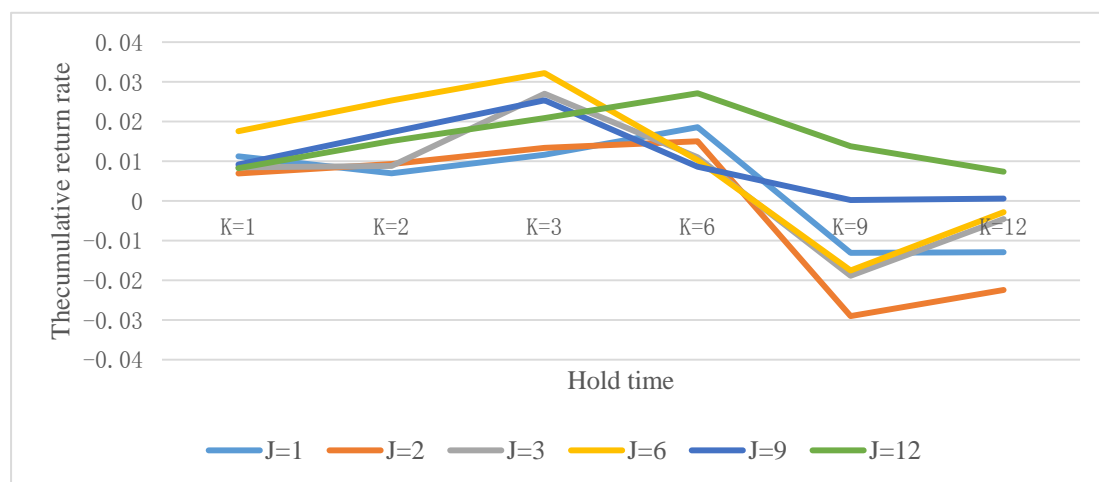


Fig. 1-The cumulative rate of return of different formation combinations over the holding period of time

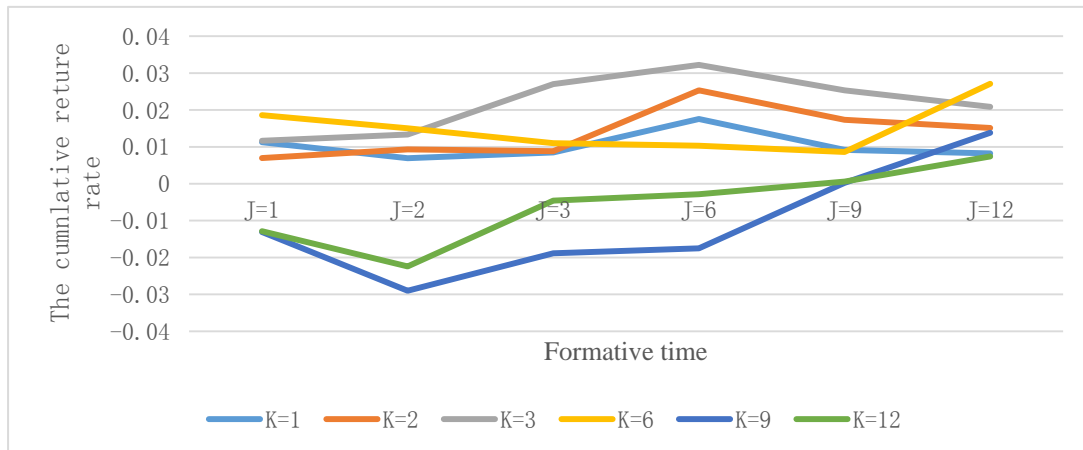


Fig. 2-The cumulative rate of return of different holding period combinations over the formation of time

(3) “Fig. 2” describes the evolution where the cumulative excess return of combination changes with the formation period in different holding periods, we can see, the cumulative excess returns is generally less than 0 when the holding period is 9 months or 12 months, and it specifies that the combinations of these two periods exist a reversal effect. However, the cumulative excess returns above 0 when the holding period is 1,2,3,6 months, indicates that the combinations of these holding periods exist momentum effect. Meanwhile, considering the holding period less three months, we find, in addition to the formation of 1 month, the rest of the formations exhibit following characteristics: the longer the holding period, the larger momentum effect combination gains.

In summary, we find that, when the formation is under the same circumstances, excess earnings of zero-cost momentum investment strategy increases as the holding period first then decreases. When the holding period is less than six months, the market mainly display the momentum effect. When the holding period is more than six months, the market mainly shows the reversal effect.

#### 4 Conclusion

In this paper, we exam whether the momentum and reversal effect exist in Chinese A-share market by adopting Jegadeesh & Titman research methods, we find that there are short-term reversal effect and medium-term momentum effect in our A-share market, for such a conclusion, we believe it’s effective to explain this phenomenon based on BSV model theory.

According to BSV model<sup>7</sup>, momentum and reversal effect can be explained by investor cognition biases, which conclude Representativeness Bias and Heuristic Bias. Respectively, Representativeness Bias focus on the recent change of data and information but ignore the long swings, thus correcting the overreaction can cause the reversal effect. In terms of Heuristic Bias on the other hand, unable to adjust the expectation and operation according to the latest information is accompanied with under-reaction, which will finally lead to momentum.

To be specific, the Representativeness Bias of Chinese stock investors, especially

individual investors is quite obvious. With the lack of information, the data reflecting long swings and advanced analytical approach are nearly monopolized by institutional investors. As a result, individual investors can only make decisions by their experience and according to recent data and information, which is a typical Representativeness Bias. Moreover, policies have tremendous influence on Chinese stock market, hence investors are always policy sensitive, which is a reason of overreaction in short term. According to the above, Chinese stock market shows a short term momentum and long term reversal, which is exactly conform to our empirical results.

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