# An Empirical Study of The Profitability of Momentum Strategies In The Chinese Stock Market

## —— Before and After the Non-tradable Share Reform

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## Abstract

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This paper evaluates the profitability of momentum strategies before and after the Non-tradable Share Reform in the Chinese Stock Market. The reform started from May 2005 and ended in December 2007. It aims to improve the liquidity and transparency of the Chinese stock market by decreasing the weight of non-tradable stock shares, and increasing the weight of tradable stock shares issued by listed companies. My objective is to observe whether momentum effect or reversal effect exist during these two time periods, considering the fact that momentum and reversal effects have a tight relationship with market efficiency.

I apply the J Months/ K Months strategy (also known as momentum strategy) suggested by Jegadeesh and Titman (1993) in my study, where

I form a winner's portfolio and loser's portfolio based on their returns in the past 6 months, then I hold these two portfolios for both 6 and 12 months to generate the winner-loser returns.

My results show that before the Non-tradable Share Reform, positive profits can be generated by applying the momentum strategies. However, after the Non-tradable Share Reform, momentum effect is replaced by a significant reversal effect. These results probably can be explained by the behavioral models. According to behavioral literature, investors tend to be either underreact or overreact when dealing with stock tradings. To be specific, in this study, before the Non-tradable Share Reform, the trading environment is so inefficient that investors tend to become irrational when making a investment decision, which leads to the momentum profits. After the Non-tradable Share Reform, however, the equity market is becoming more efficient that stock prices turn back to their fair values, and as a result, the returns are reversed eventually.

Keywords: momentum, contrarian, reversal, China, stock returns, behavioral finance

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# Contents

# Ⅰ. Introduction

## Ⅰ.1 Background and Context

Momentum and reversal effect have become hot research topics among scholars and stock analysts since these two effects were first documented. Momentum effect refers to the phenomenon in where buying stocks that have higher returns in the past and selling stocks that have lower returns over the same time period generate significant positive returns. Conversely, reversal effect refers to the phenomenon in where buying stocks that have lower returns in the past and selling stocks that have higher returns in the past generate significant positive returns.

The discovery of momentum and reversal effect is regarded as a big challenge towards the efficient market hypothesis, which explains why this topic has been hotly debated since its inception. The efficient market hypothesis, first proposed by Fama（JF 1970), argues that in an efficient market, information is fully and immediately reflected. In other words, it is impossible to make abnormal profits by taking advantage of information to form buying or selling transactions. The efficient market hypothesis consists of three forms, weak, semi-strong and strong form. The weak-form states all past prices of a stock are reflected in the current stock price, hence positive returns cannot be earned by analyzing historical share prices or any other form of historical data. The semi-strong form, states that stock prices adjust to public information rapidly, as a result, no positive returns can be earned by using either technical or fundamental analysis. The strong form states

that stock prices reflect both public and private information, thus no excess returns can be earned. The efficient market hypothesis has been regarded as one of the greatest academic theories to come out of the 20th century. Numerous financial theories and empirical studies on stock markets are conducted based on this hypothesis. However, with the formation and development of a new school of financial theory, behavioral finance, the dominant position of the efficient market hypothesis is challenged. In addition with anomalies such as the January effect, Monday effect, small firm effect, etc…, the momentum effect and reversal effect implies that investors can earn excess returns by analyzing historical data, thus invalidating all forms of the efficient market hypothesis.

Several studies have pointed out that by applying momentum strategies to empirical investments; positive economic values can be generated. According to Jegadeesh and Titman (1993), buying the past winner and selling the past loser generate significant positive returns over 3-to-12-month holding periods. In further studies, Jegadeesh and Titman (2001) prove that the original result of momentum effect is not a product of data mining. They also suggest that momentum returns are generated by the delayed overreaction's of investors. When this overreaction disappears, stock prices will go back to its balanced price, leading to a return in reversal effect. In China, a number of papers on momentum and reversal effect have come to a variety of conclusions. Some papers imply that the Chinese stock market exists short-term to intermediate-term momentum effect, with long term reversal effect. Other papers suggest that it exists short-term to intermediate-term reversal effect without any sign of momentum effect.

## Ⅰ.2 Main Objectives

In this paper, I focus on the profitability of momentum strategies in the Chinese stock market. The reason for this study on momentum strategies is because compelling evidences has shown that momentum effect has a very important economic value, hence having a good understanding of it will help investors to better perform in the stock market. The reason for choosing the Chinese stock market as the objective of this study is because after the implementation of new security trading policies by China's Securities Regulatory Commission, the Chinese stock market has gone through tremendous changes over the past decade. These new changes aim to strengthen the transparency, liquidity, and efficiency of the Chinese stock market. One of the most significant reforms is the Non-tradable Share Reform lasting from May 2005 to December 2007. This reform attempts to enhance stock market liquidity by requiring listed companies in the stock market to lower the portion of non-tradable stock shares, and to increase the portion of tradable shares. This reform is believed to be a milestone in terms of evolving the Chinese stock market, from one that lacked transparency and fairness, to a sounder and more efficient one

One set of existing literature that studies the momentum effect on the Chinese stock market mainly focuses on the time period before the completion of the Non-tradable Share Reform. The other set of literature focuses on the whole timeline till 2010, without splitting the time period into two parts, before and after the stock reform. Since previous literature

shows that momentum effect and reversal effect have a tight relationship with market efficiency, stock performance should turn out to be quite different in an efficient market compared to its performance in a less efficient one. This means that the efficiency level of the stock market would affect the existence of either momentum effect or reversal effect. This paper will test the above hypothesis by making a comparison of the stock market performance before and after the Non-tradable Share Reform.

Specifically, the main (testable) hypothesis of my study is that before China's Securities Regulatory Commission implemented the Non-tradable Share Reform, investors acted irrationally to the stock prices due to the lack of transparency and liquidity in the stock market. Thus, momentum strategies of buying past winners and selling past losers could be used to gain positive profits. On the other hand, after the Non-tradable Share Reform was put into action, I expect that irrational behavior will disappear due to the improvement of stock market liquidity, so that stock prices will turn back to their fair value, and hence the momentum effect may become weak, instead having a reversal effect appear.

By doing an event study on whether momentum effect or reversal effect exist during these two time periods--before May 2005, which was before the Non-tradable Share Reform started, and from the beginning of 2008, which was after the Non-tradable Share Reform was completed,  it helps both security regulators and investors to have a better understanding of the current investment environment of the Chinese stock market, to see if it is on the way to become more efficient in regards to its transparent investment environment and its stock price setting mechanisms. This will help investors

no matter institutional or individual investors to better perform in their investment tradings, and also can help the stock market keep emphasis on its self-regulations in order to make for a sound and mature stock market in the future.

## Ⅰ.3 Achievements

My results show that before the Non-tradable Share Reform, positive profits can be generated by applying the momentum strategies. However, after the Non-tradable Share Reform, momentum effect is replaced by a significant reversal effect. In other words, during this period, positive profits can be generated by applying the contrarian strategies.

My results also show that the two different consequences mentioned before can be probably explained by the behavioral model. Daniel, Hirshleifer and Subrahmanyam (1998) explain these two effects based on overreaction theory, while Hong and Stein (1999) explain them based on underreaction theory. Behavioral literature claims that before the Non-tradable Share Reform, the trading environment was so inefficient that investors tended to become irrational when making an investment decision, which led to momentum profits. After the Non-tradable Share Reform, the equity market is becoming more efficient in that stock prices turn back to their fair values, and as a result, the returns are reversed eventually.

## Ⅰ.4 Overview of Dissertation

The remainder of my paper is organized as follows: Section Ⅱ describes

previous literature regarding the momentum effect and reversal effect on both the Chinese stock market and other foreign stock markets. Section Ⅲ briefly introduces the necessity and the progress of China's Non-tradable Share Reform which lasts from May 2005 to December 2007. Section Ⅳ describes the trading strategies and data set I'm using. The investigation of profitability of momentum strategy is carried out in Section Ⅴ, in which part it presents a set of empirical tests on the momentum strategies in two sub periods with different holding periods. In particular, I observe the two momentum strategies with 6 and 12 months holding period. Section Ⅵ provides possible explanations to the results I get. Section Ⅶ is the conclusion part of my paper.

# Ⅱ. Previous Literature

## Ⅱ. 1 Previous Literature on Other Foreign Stock Markets

A number of previous literature indicate that positive stock returns can be generated on the basis of past returns, which is a challenge to the traditional Efficiency Market Hypothesis theories. Jegadeesh and Titman (1993) first documents the existence of a momentum effect, indicating that buying stocks that have performed well in the past and selling stocks that have performed poorly in the past yield significant abnormal returns over the 1965 to 1989 period. Furthermore, they examine the robustness of this strategy by selecting stocks based on their past 6-month returns and holding

them for another 6 months. It turns out to generate an abnormal return of 12.01% per year on average. According to the paper, the positive profits are attributed to the delayed price reaction of individuals to firm-specific information. After the momentum strategies were examined, more and more scholars started to do research on this topic. Chan, Jegadeesh and Lakonishok (1996) provide the evidence that momentum in stock prices arise from the markets under reaction to earnings-related information. The strategies are based on either past returns (refer to as price momentum strategy) or on past earnings surprises (refer to as earning momentum strategy). In general, the price momentum effect tends to be stronger and longer-lived than the earnings momentum effect. Moskowitz and Grinblatt (1999) came up with the concept called industry momentum. They suggested that momentum investment strategies, which buy past winning stocks and sell past losing stocks, are significantly less profitable once controled for industry momentum. By contrast, industry momentum strategies, which is to buy stocks from past winning industries and to sell stocks from past losing industries is highly profitable [1]. Lee and Swaminathan (2000) show in their paper that "momentum" and "value" strategies are linked by past trading volume. They find that firms with high (low) past turnover ratios earn lower (higher) future returns, and have consistently more negative (positive) earnings surprises. They also noted that the momentum effect will be reversed over a five year period.

In addition to the studies on the American stock markets, scholars have also conducted a wide range of empirical studies on other countries' stock

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[1] Moskowitz and Grinblatt (1999) indicate that industry momentum strategy is significant even after controlling for size, book-to-market equity etc.

markets, and have gained significant evidence that by implementing momentum strategies, investors can earn positive profits. By taking a look at 1700 firms from 20 countries, Geert Rouwenhorst (1998) finds emerging market stocks exhibit momentum effect too. This evidence shows that the momentum effect is believed to occur not only in the American stock market but also in global stock markets. In his further study, Geert Rouwenhorst indicates that turnover ratio is significantly higher among winner portfolios compared to that of loser portfolios. In addition, small firms and value stocks tend to have a stronger momentum effect, compared to large firms and growth stocks. In another paper written by Chan, Hameed and Hong (2000), they indicate significant evidence of momentum profits exist in international stock markets. The momentum profits arise mainly from time-series predictability in stock markets. They also discovered that markets with higher volume in the previous period generate higher profits for momentum strategies. Jegadeesh and Titman (2011) evaluates various explanations for the profitability of momentum strategies documented in Jegadeesh and Titman (1993). They find that momentum strategies generate positive profits in the 1990s. These excess returns are due to investors' delayed overreactions to stock prices that are eventually reversed.

There are also a lot of papers regarding contrarian strategies, which provide evidence that buying the past losers and selling the past winners generate positive profits. For example, DeBondt and Thaler (1985） discovered weak form market inefficiency in their paper, and suggest that stock prices overreact to information, thus long-term past loser outperforms long-term past winner. This phenomenon is referred to as contrarian

strategies. DeBondt and Thaler (1987) report further evidence to the overreaction hypothesis, indicating that excess returns are owed to both short-term and long-term past performance. Lakonishok, Vishny, Shleifer (1994) provide evidence indicating that the reason why contrarian investment earns positive profits is because it uses the mistakes of typical irrational investors, not because the contrarian strategy itself is fundamentally risky.

## Ⅱ. 2 Previous Literature on the Chinese Stock Market

With the development of China's economy and the growth of its equity market, more and more scholars began to try to find the answer to whether there exists momentum effect or reversal effect in the Chinese stock market. Wang Shuihong and Zhao Xuejun (2001) carry out an empirical test on momentum strategies and contrarian strategies in the Chinese stock market. They use the data set from 1993 to 2000, including 48 listed companies that have issued IPO on both Shanghai and Shenzhen Stock Exchange. They reached the conclusion that by applying the J/K months strategy into their study, they find out that the winner-loser portfolio gains no significant momentum profits, however, to some extent, the profits are reversed. They argue that there is no possibility to gain positive excess returns by buying winners and selling losers. However, considering that their data sample is too small to provide statistically significant results, their conclusion remains doubtful. Zhou Linjie (2002) studies the data sample from 1995 to 2000 time period on Shanghai and Shenzhen Stock Exchange by using the concept of formation, holding period of winner-loser portfolio. Her study

results in significant momentum effect among the portfolio with one month formation and one month holding period as well. However, the holding period of portfolio becomes longer and longer, the excess return of momentum strategies significantly declines. Kang, Liu and Ni (2002) find statistically significant positive profits for short-term contrarian strategies and intermediate-term momentum strategies by observing data in "A" shares on the Chinese stock market[2]. Their analysis also indicates that the short-term contrarian profits are owed to investors' overreaction to firm-specific information, but overreaction is not the only reason to explain intermediate-term momentum profits. Wu Shinong and Wu Chaopeng (2003) propose that buying winner's portfolio and selling loser's portfolio that have a six months formation period it will generate positive excess returns in the next one year holding period. Moreover, by applying the Chan, Jegadeesh and Lakonishok (1996)'s methodology into their empirical test, they find that a stock's prior six months' return and the most recent earning surprises help to predict future returns. The drift in future returns is significant and will last for at least six months. Wang Zhiqiang, Wang Yueyin, Xu Bo and Duanyu (2003) present that firm scale has a positive correlation with momentum effect. Liu Yuhui, He Juhuang and Shen Keting (2003) report that whether reversal effect occurs or not depends on the policies implemented in different industries. Xu Shuwei (2004) reports in his paper that momentum strategies with ten-to-fifteen days of formation and holding period generate positive returns. Chen Qiao and Wang Tao (2003), Du

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2 "A" shares are specialized shares in the mainland China that are purchased and traded on Shanghai and Shenzhen stock exchanges. "B" shares are owned by foreigners who cannot purchase "A" shares due to Chinese government restrictions.

Minjie and Lin Yin (2005) both indicate that momentum effect has a close relation with firm industries. Furthermore, Du Minjie and Lin Yin point out that the momentum effect gets weaker as the holding period gets longer, however, it first gets stronger then weaker with the extension of the formation period.

# Ⅲ. Brief Introduction of China's Non-tradable Share Reform (2005-2007)

## Ⅲ. 1 The Importance of the Non-tradable Share Reform

Due to some historical reasons, the basic infrastructure of stock shares issued in the Chinese stock market is composed of three fractions--state-owned shares, corporate-owned shares, and individual shares. The three different types of shares are further split into tradable shares and non-tradable shares. Tradable shares refer to stock shares that are liquid in the stock market while non-tradable shares refer to state-owned and corporate-owned shares, which cannot be freely traded in the stock market. By the end of 2004, the total number of non-tradable stock shares were up to 454.3 billion, which accounted for ⅔ of the total number of 719.4 billion stock shares traded in the stock market.

There are mainly two reasons that why it is urgent to implement a stock reform regarding the abolishment of the no-trading rules. First of all, the stock splitting leads to the interest conflict between big shareholders who hold non-tradable shares and small shareholders who hold tradable

shares.The profits for big shareholders are merely related to the initial IPO or SEO prices, and the profits won't change with stock price volatility afterwards. However, the profits that small shareholders can gain largely depend on the daily trading prices. Respectively, the big shareholders are only concerned about the net value changes of the company instead of daily stock price volatility. Individual or other small shareholders' interests cannot be protected. The lack of common interest becomes a big obstacle for good corporate governance. Secondly, the fact that up to ⅔ stock shares are not liquid in the stock market leads to the problem that the current trading share scale is so small that the market is not liquid enough to be efficient. The pricing-setting mechanisms are distorted by the stock splitting rules and are not driven by effective market forces, which is one of the reasons leading to the large volatility of stock prices. In conclusion, due to the special infrastructure, we can't find a trading platform based on transparency and fairness in the Chinese stock market.  All these problems prompt that it is high time the government take actions to create a sound and efficient stock trading environment for investors.

## Ⅲ. 2 The Implement of the Non-tradable Share Reform

On April, 29th, 2005, China Securities Regulatory Commission started to carry out the Non-tradable Share Reform. This reform aims to transfer non-tradable state-owned and corporate-owned stock shares to tradable ones by requiring listed companies to reduce the percentage of state-owned and corporate-owned shares, and to give more opportunity to individual investors to trade shares in order to improve the liquidity of the stock market.

The specific solution is that companies either sell the non-tradable shares directly in the open market or allocate non-tradable shares to the current small shareholders who hold tradable shares. By the end of 2007, the market capitalization of the listed companies who have completed the stock reform makes up 98% of the total market capitalization, with only 33 listed companies unfinished. As presented in Table Ⅰ, after the Non-tradable Stock Reform was completed, approximately 1.54 million stock shares were transferred from non-tradable to tradable type, with a changing rate of 42.23%.

## Table Ⅰ

## The Percentage of Non-tradable Shares Before and After the Non-tradable Share Reform

This table presents the percentage of non-tradable stock share numbers owned by the state and corporations before and after the Non-tradable Share Reform. I sort the stocks by market capitalization into four size groups: 25%, 50%, 75% and 100%. "Before" shows the total number of illiquid shares before the stock reform, and "After" shows the total number of illiquid shares after the stock reform. "Change" is the share numbers and "Changing rate" is the percentage of shares being transferred from non-tradable to tradable.

|  | Mean | 25% | 50% | 75% | 100% |
|---|---|---|---|---|---|
| Before (in million shares) | 3.52 | 0.56 | 1.1 | 1.92 | 17.61 |
| After (in million shares) | 1.98 | 0.15 | 0.53 | 1.07 | 10.98 |
| Change (in million shares) | 1.54 | 0.41 | 0.57 | 0.85 | 6.63 |
| Changing rate (in percentage) | 42.23 | 27 | 46 | 58 | 81 |

# IV. Data and Methodology

## IV.1 Data and Sample

I study the monthly return of stocks using a data set constructed from China CSMAR database. The database contains detailed information on all security transactions in the Chinese equity market. The accuracy and variety of the data samples make it the most preferred database for academic studies on the Chinese equity market. My data sample contains all common domestic stocks that were traded on Shanghai Shenzhen Index 300 in the Chinese stock market. The two sample time periods are between April 1, 2000 to April 31, 2005, and between January 1, 2008 to December 31, 2011. The advantage of using Shanghai Shenzhen Index 300 instead of other indexes is because evidence shows that compared to other indexes, Shanghai Shenzhen Index 300 is less volatile during the recession of 2008 and during the European Financial Crisis of 2011. My data set contains 164 stocks with 365.12 billion RMB market cap over 10 years[3]. Table II presents the summary statistics of the data set. The data sample is constructed from April 1, 2000 to April 31, 2005, and from January 1, 2008 to December 31, 2011. There are a total of 17,034 monthly observations over a 10 year observation period. The average market capitalization for all stocks is 21.44 million RMB, but it ranges from 4.21 million RMB for small stocks, 9.81 million RMB for mid-cap stocks, to 50.28 million RMB for large stocks.

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[3] I deleted the stocks that didn't keep a consistency during the whole observing time periods.

The total market capitalization for all stocks is up to 365.12 billion RMB. It is also showed in Table II that the average monthly return rate for all stocks is -0.07%, but it ranges from -0.83% for small stocks to 0.64% for large stocks. We note that in general, Shanghai Shenzhen Index 300 generates accumulated negative monthly returns over the ten year period.

## IV.2 Methodology

In my paper, I follow the momentum strategy, also known as J-month/ K-month strategy created by Jegadeesh and Titman (1993). According to their paper, the construction of the strategy can be concluded as follows: At the beginning of each month t, the securities are grouped into ten portfolios in descending order based on their returns in the past J months. Therefore, ten decile portfolios are formed. The top decile portfolio is called the "winner", containing top 10% stocks that have earned the largest returns in the past. Respectively, the bottom decile is called the "loser", containing 10% stocks that have suffered the largest losses in the past. This classifying procedure is referred to as the formation period of momentum strategies. The next step is to buy the winner's portfolio and sell the loser's portfolio mentioned before to form a momentum strategy in each month t, and then to hold this winner-loser portfolio for K months. This second step is referred to as the holding period of momentum strategies. Also, in order to further observe the reversal effect, the winner-loser portfolio will be held for another L months. This phase is referred to as the post holding period of momentum strategies.

In my paper, I set J as 6 months, K as 6 months and 12 months, L as 6

months. I carry out two empirical tests. The first empirical test is to construct a momentum portfolio with 6 months formation period, 6 months holding period and 6 months post-holding period. The second test is to construct a momentum portfolio with 6 months formation period, 12 months holding period, and 6 months post-holding period.

In order to observe the performance of the Chinese stock market before and after the Non-tradable Share Reform, I split the data sample into two sub periods. One period is before the stock reform (2000.04~2005.04), while the other one is after the stock reform (2008.01~2011.12). The purpose of doing so is to have a close look at if the stock market has different performance in these two sub periods.

**Table Ⅱ**
**Summary Statistics of Data Sample (2000.04~2005.04, 2008.01~2011.12)**

The sample of stocks for the study consists of all common domestic stocks that were traded on Shanghai Shenzhen Index 300 in the Chinese stock market. The two sample time periods are between April 1, 2000 to April 31, 2005, and between January 1, 2008 to December 31, 2011. There are 164 stocks in my sample, with 17034 monthly observations. For each stock, I compute its market capitalization and monthly rate of return. I sort the stocks by market capitalization and form three size groups: small stocks, mid-cap stocks, and large stocks. The mean and median of cap and return rate measures are presented for the entire sample period.

| | | Mean | 25% | 50% | 75% | 100% | Sum | Std.Dev | Observation |
|---|---|---|---|---|---|---|---|---|---|
| Cap | All stocks | 21.44 | 5.27 | 9.37 | 19.74 | 1189.37 | 365123.89 | 48 | 17034 |
| (in million ￥) | Small stocks | 4.21 | 3.22 | 4.16 | 5.27 | 6.38 | 23857.13 | 1.25 | 5678 |
| | Mid-cap stocks | 9.81 | 7.63 | 9.37 | 11.71 | 15.06 | 55703.51 | 2.46 | 5678 |
| | Large stocks | 50.28 | 19.73 | 27.45 | 51.27 | 1189.37 | 285563.24 | 75.08 | 5678 |
| Monthly Return Rate | All stocks | -0.0007 | -0.0667 | -0.0034 | 0.062 | 0.945 | -11.3695 | 0.1179 | 17034 |
| (in percentage) | Small stocks | -0.0083 | -0.0663 | -0.0106 | 0.0484 | 0.6046 | -47.07 | 0.1 | 5678 |
| | Mid-cap stocks | -0.0001 | -0.0658 | -0.0023 | 0.0638 | 0.849 | -0.8145 | 0.1204 | 5678 |
| | Large stocks | 0.0064 | -0.0681 | 0.0023 | 0.0771 | 0.945 | 36.52 | 0.13 | 5678 |

Regarding the t-statistics test, I used a Newey-West estimator to compute the t-statistics for the cumulative returns. The advantage of the estimator is that it helps overcome the effects of correlation in the time series data. In the case of momentum strategies, since overlapping monthly returns are used to calculate the cumulative returns in event time, the Newey-West estimator can eliminate the correlation errors.

# Ⅴ. The Profitability of Momentum Strategies

My goal is to look at whether the Non-tradable Share Reform helps the Chinese stock market to become more efficient. In order to make the comparison, I split the data sample into two periods--before and after the Non-tradable Share Reform, and then look at the sub period data sets separately on the basis of the 6 months formation period, 6 months holding period and 6 months post-holding period. In order to improve the reliability of the test, I carry out a robustness test by repeating the momentum strategies again, but extend the holding period from 6 months to 12 months.

## Ⅴ.1 Portfolio with 6 Months Holding Period

In this part, I carry out the momentum strategies by forming winner's and loser's portfolio on the basis of their past six month performance, and then hold them for another six months. All the tests are grouped into two sub periods, before the Non-tradable Share Reform (2000.04--2005.04), and after the Non-tradable Share Reform (2008.01--2011.12).

## Ⅴ. 1.1 The Stock Returns in the Formation Period

Table Ⅲ provides summary statistics of the monthly return rate of momentum strategies in the formation period. In my empirical test, at the beginning of every month, the securities are grouped into ten portfolios in descending order based on their returns in the past six months. On one side, the top decile portfolio, which contains stocks that have the highest rate of returns, is referred to as the "winner" portfolio. On the other side, the bottom decile contains stocks that have the lowest rate of returns, is referred to as the "loser" portfolio. Panel A presents the momentum portfolio returns before the implement of Non-tradable Share Reform, including five years' statistics. The average monthly return rate of winner's portfolio is 0.30% in 2000, 0.17%, 0.23%, 0.32% and 0.29% in the following four years from 2001 to 2004. Respectively, the average monthly return rate of loser's portfolio is -0.25% in 2000, -0.27%, -0.26%, -0.26%, -0.43% over the second through fifth years. The total average monthly return rate of winner's portfolio over the five years is 0.26%, while the total average monthly return rate of loser's portfolio is -0.28%. It is easy to notice that the winner's portfolio earns better profits than loser's portfolio by a difference of 0.20%. In Panel B, it reports the momentum portfolio returns after the implementation of Non-tradable Share Reform, which includes four years' statistics. The average monthly return rate of winner's portfolio is 0.30% in 2008, 0.51%, 0.42% and 0.09% in the following three years. Respectively, the average monthly return rate of loser's portfolio is -0.65% in 2008, -0.20%, -0.23% and -0.42% over the second through fourth years. The total average monthly return rate of winner's portfolio for the four year is 0.35%,

**Table Ⅲ**
**Average Monthly Returns in The Formation Period**

This table reports the average monthly return for winner's and loser's portfolio in the foundation period both before and after the Non-tradable Share Reform. W-L shows the difference of return rates between the winner and loser. T-statistics test whether the returns are reliably different from zero. Panel A shows the result before the stock reform. Panel B shows the result after the stock reform. Panel C shows the result of the full time period. All the results are in percentage.

| | Panel A: Average Monthly Returns In The Formation Period (2000.04~2005.04) | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 2000 | Std | 2001 | Std | 2002 | Std | 2003 | Std | 2004 | Std | Total avg ret | Std |
| Winner | 0.304 | 0.0923 | 0.1724 | 0.1342 | 0.2339 | 0.1532 | 0.3216 | 0.1529 | 0.2869 | 0.0393 | 0.2619 | 0.1363 |
| Loser | -0.2456 | 0.0536 | -0.273 | 0.1283 | -0.2625 | 0.0864 | -0.2552 | 0.172 | -0.4346 | 0.076 | -0.2821 | 0.1262 |
| W-L | 0.5496 | 0.0759 | 0.4454 | 0.041 | 0.4964 | 0.1076 | 0.3216 | 0.0552 | 0.7215 | 0.0574 | 0.1095 | |
| t | | | | | | | | | | | 3.56 | |
| | Panel B: Average Monthly Returns In The Formation Period (2008.01~2011.12) | | | | | | | | | | | |
| | 2008 | Std | 2009 | Std | 2010 | Std | 2011 | Std | | | Total avg ret | Std |
| Winner | 0.296 | 0.5223 | 0.5061 | 0.2612 | 0.4218 | 0.1682 | 0.0939 | 0.0866 | | | 0.3452 | 0.3405 |
| Loser | -0.646 | 0.5386 | -0.1951 | 0.2352 | -0.2277 | 0.1049 | -0.4229 | 0.1069 | | | -0.3692 | 0.3555 |
| W-L | 0.942 | 0.0998 | 0.7012 | 0.1237 | 0.6495 | 0.0912 | 0.5168 | 0.0518 | | | 0.7144 | 0.1794 |
| t | | | | | | | | | | | 6.72 | |
| | Panel C: Average Monthly Returns In The Formation Period (Full Time Period) | | | | | | | | | | | |
| | Total avg ret | Std | | | | | | | | | | |
| Winner | 0.2946 | 0.1758 | | | | | | | | | | |
| Loser | -0.3408 | 0.2946 | | | | | | | | | | |
| W-L | 0.6354 | 0.2698 | | | | | | | | | | |
| t | 4.85 | | | | | | | | | | | |

while the total average monthly return rate of loser's portfolio is -0.37%. Similar to the result before, winner's portfolio earns better profits than loser's portfolio by a difference of 0.71%. Panel C presents the average monthly return rate of winner's portfolio and loser's portfolio over the total 110 months, both before and after the Non-tradable Share Reform. In general, winner's portfolio has positive monthly returns, while loser's portfolio has negative monthly returns. The difference between the two portfolios is 0.63%.

## Ⅴ. 1.2 The Stock Returns In the Holding Period

Table Ⅳ provides summary statistics of the monthly return rate for momentum strategies in the holding period. As reported in the prior section, the winner's portfolio and the loser's portfolio have been composed based on their returns in the past six months. Now momentum strategies are carried out by buying the winner's portfolio and by selling the loser's portfolio in each month. Let's define the portfolio resulting from momentum strategies as winner-loser portfolio. The winner-loser portfolio will be held for six months in my first empirical test. Panel A presents the momentum portfolio returns before the implementation of the Non-tradable Share Reform in the holding period, including five years' statistics. The average monthly return of the winner's portfolio in the holding period declined to -0.09% in 2000, -0.07%, 0.09%, 0.02% and 0.13% in the following four years. Respectively, the average monthly return of the loser's portfolio in their holding period goes up to -0.18% in 2000, 0.002%, 0.03%, -0.12%, -0.15% over the second through fifth years. The total average monthly return of winner's portfolio in the holding period is -0.0003%, declining from significantly positive in the formation period to a negative one. The total average monthly return of loser's portfolio is -0.08%, which has increased slightly.

**Average Monthly Returns in the Holding Period (6 Months)**

This table reports the average monthly return for winner-loser portfolio in the holding period both before and after the Non-tradable Share Reform. The holding period is 6 months. W-L shows the difference of return rates between the winner and loser. T-statistics test whether the returns are reliably different from zero. Panel A shows the result before the stock reform. Panel B shows the result after the stock reform. Panel C shows the result of the full time period. All the results are in percentage.

| | Panel A: Average Monthly Returns In The Holding Period (2000.04~2005.04) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | Std | 2001 | Std | 2002 | Std | 2003 | Std | 2004 | Std | Total avg ret | Std |
| Winner | -0.0917 | 0.0706 | -0.0738 | 0.1032 | 0.0915 | 0.1236 | 0.0173 | 0.1267 | 0.133 | 0.0532 | -0.00028 | 0.1306 |
| Loser | -0.1814 | 0.1038 | 0.0024 | 0.1495 | 0.0267 | 0.1441 | -0.1234 | 0.1703 | -0.1521 | 0.0521 | -0.0768 | 0.1589 |
| W-L | 0.0897 | 0.0687 | -0.0762 | 0.0883 | 0.0648 | 0.0774 | 0.1407 | 0.178 | 0.2851 | 0.0697 | 0.07652 | 0.14574 |
| t | | | | | | | | | | | 3.07 | |
| | Panel B:Average Monthly Returns In The Holding Period (2008.01~2011.12) | | | | | | | | | | | |
| | 2008 | Std | 2009 | Std | 2010 | Std | 2011 | Std | | | Total avg ret | Std |
| Winner | 0.112 | 0.2438 | -0.0368 | 0.2114 | -0.0935 | 0.1976 | -0.0084 | 0.1013 | | | -0.0166 | 0.2164 |
| Loser | 0.337 | 0.3537 | -0.0266 | 0.1894 | -0.0742 | 0.1293 | -0.0925 | 0.1173 | | | 0.0508 | 0.2855 |
| W-L | -0.225 | 0.2331 | -0.0102 | 0.1564 | -0.0193 | 0.1047 | 0.0841 | 0.098 | | | -0.0674 | 0.1839 |
| t | | | | | | | | | | | -2.12 | |
| | Panel C:Average Monthly Returns In The Holding Period (Full Time Period) | | | | | | | | | | | |
| | Total avg ret | Std | | | | | | | | | | |
| Winner | -0.054 | 0.2298 | | | | | | | | | | |
| Loser | -0.069 | 0.2818 | | | | | | | | | | |
| W-L | 0.015 | 0.1809 | | | | | | | | | | |
| t | 0.74 | | | | | | | | | | | |

in 2001, when winner-loser portfolio generates a negative profit, the other years, the winner's portfolio earns positive profits, whereas the loser's portfolio suffers losses. The average monthly difference of 0.08% between these two portfolios generates significant momentum profits. Hence it can be concluded that before the Non-tradable Share Reform, momentum profits can be generated in the Chinese stock market. In Panel B, it reports the momentum portfolio returns after the Non-tradable Share Reform in the holding period, including four years' statistics. The average monthly return of the winner's portfolio has decreased to 0.11% in 2008, -0.04%, -0.09% and -0.008% in the following three years. Respectively, the average monthly return of the loser's portfolio is 0.34% in 2008, -0.03%, -0.07% and -0.09% over the second through fourth years. As noticed from the table, the total average monthly return of winner's portfolio in the holding period is -0.02%, declining from significantly positive in the formation period to the very negative one. In contrast, owing to the large positive gains in year 2008, the total average monthly return of the loser's portfolio is 0.05%, which has been reversed from loss in the formation period into gains. In the period after the Non-tradable Share Reform, it is examined that buying winner's portfolio and selling loser's portfolio can no longer generate momentum profits. Instead, it generates reversal profits. Hence it can be concluded that in this empirical test, the momentum effect disappears after the stock reform, and is replaced by the reversal effect. To be more specific, by buying the loser's portfolio and selling the winner's portfolio, positive profits can be earned. This strategy is known as Contrarian Strategies. Panel C includes the total 10 years' average monthly returns of winner-loser portfolio both before and after the Non-tradable Share Reform. In the full time period, empirical test shows that a momentum profit of 0.02% is gained, but it has no significant t-statistic to support this result.

## Ⅴ. 1.3 The Stock Returns in the Post-holding Period

Table Ⅴ reports summary statistics on the monthly return rate of momentum strategies in the post-holding period in order to first investigate the robustness of long-term return reversal effect that has been observed in the holding period, 2008 to 2011, then to examine the possibility of long-term reversal effect in the time period 2000 to 2005. The winner-loser portfolio will be held for another six months in this paper. The returns in the post-holding period turn out to be consistent with the result in the holding periods. Panel A presents the momentum portfolio returns before the implementation of Non-tradable Share Reform in the post-holding period. The average monthly return of the winner's portfolio in the post-holding period is -0.07% in 2000, -0.01%, -0.02% and -0.02% in the following three years. Respectively, the average monthly return of the loser's portfolio in their post-holding period is -0.08% in 2000, -0.05%, 0.03%, and -0.15% over the second through fourth years. The total average monthly return of the winner's portfolio in the post-holding period is -0.03%, whereas the total average monthly return of the loser's portfolio is -0.06%. In general, before the Non-tradable Share Reform, a momentum profit of 0.03% can be generated in the Chinese stock market. However, compared to its performance in the holding period, the momentum effect becomes weaker. In Panel B, it reports the momentum portfolio returns after the implementation of Non-tradable Share Reform in the post-holding period. The average monthly return rate of the winner's portfolio is 0.06% in 2008, 0.02% in 2009 and -0.19% in 2010. Respectively, the average monthly return rate of the loser's portfolio is 0.18% in 2008, 0.01% in 2009, and -0.14% in 2010. The total average monthly return of winner's portfolio in the post-holding period is -0.04%, while it is 0.02% for the loser's portfolio. It is examined that in the post-holding period, the return on winner-loser portfolio after the Non-tradable Share Reform is still significantly reversed.

## Table V
### Average Monthly Returns In The Post-holding Period

This table reports the average monthly return for winner-loser portfolio in the post-holding period both before and after the Non-tradable Share Reform. The holding period is 6 months. W-L shows the difference of return rates between the winner and loser. T-statistics test whether the returns are reliably different from zero. Panel A shows the result before the stock reform. Panel B shows the reuslt after the stock reform. Panel C shows the result of the full time period. All the results are in percentage.

| | Panel A:Average Monthly Returns In The Post-holding Period (2000.04~2005.04) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | Std | 2001 | Std | 2002 | Std | 2003 | Std | Total avg ret | Std |
| Winner | -0.072 | 0.1253 | -0.0102 | 0.0925 | -0.0218 | 0.197 | -0.0231 | 0.0813 | -0.0319 | 0.1308 |
| Loser | -0.0795 | 0.1764 | -0.0472 | 0.1263 | 0.0305 | 0.1454 | -0.1517 | 0.0675 | -0.0601 | 0.1469 |
| W-L | 0.0075 | 0.0964 | 0.037 | 0.054 | -0.0523 | 0.0927 | 0.1286 | 0.0737 | 0.0282 | 0.1019 |
| t | | | | | | | | | 2.17 | |
| | Panel B: Average Monthly Returns In The Post-holding Period (2008.01~2011.12) | | | | | | | | | |
| | 2008 | Std | 2009 | Std | 2010 | Std | | | Total avg ret | Std |
| Winner | 0.0605 | 0.218 | 0.0209 | 0.1794 | -0.1876 | 0.142 | | | -0.0354 | 0.2087 |
| Loser | 0.1839 | 0.3077 | 0.01 | 0.0565 | -0.1392 | 0.0815 | | | 0.0182 | 0.2253 |
| W-L | -0.1234 | 0.159 | 0.0109 | 0.1408 | -0.0484 | 0.0938 | | | -0.0536 | 0.1416 |
| t | | | | | | | | | -2.39 | |
| | Panel C:Average Monthly Returns In The Post-holding Period (Full Time Period) | | | | | | | | | |
| | Total avg ret | Std | | | | | | | | |
| Winner | -0.0621 | 0.2363 | | | | | | | | |
| Loser | -0.0559 | 0.2967 | | | | | | | | |
| W-L | -0.0062 | 0.1499 | | | | | | | | |
| t | -0.36 | | | | | | | | | |

However, the reversal effect is slightly weaker compared to that during the holding period. Panel C includes the total 10 years' average monthly return of winner-loser portfolio both before and after the Non-tradable Share Reform. Like the conclusion discussed in the last part, empirical test shows that the momentum effect is insignificant in the full time period.

## Ⅴ. 2. Portfolio With 12 months Holding Period

### Ⅴ. 2.1 The Stock Returns in the Holding Period

In order to examine the robustness of the profitability of the momentum strategies and contrarian strategies, I carry out the second empirical test, where the holding period of winner-loser portfolio is extended to 12 months from 6 months with all other factors remaining the same. Table Ⅵ provides summary statistics of the monthly return rate for momentum strategies in the holding period. Panel A presents the momentum portfolio returns before the implementation of Non-tradable Share Reform, which includes four years' statistics. The winner's portfolio earns an average monthly profits of -0.07%, whereas the loser's portfolio earns an average profits of -0.10%. The average difference of 0.04% between these two portfolios generates momentum profits. Hence it can be concluded that before the Non-tradable Share Reform, momentum profits can still be generated in the Chinese stock market even though the holding period is longer. In Panel B, it reports the momentum portfolio returns after the implementation of Non-tradable Share Reform. Similarly, the total average monthly return of winner's portfolio is -0.008%, and -0.10% for the loser's portfolio. It is notable that the winner-loser portfolio gets -0.15% monthly profits, indicating that the momentum effect disappears after the Non-tradable Share Reform, and is replaced by the reversal effect. Panel C includes the total 7 years' average monthly return of winner-loser portfolio

# Table Ⅵ
## Average Monthly Returns In The holding Period (12 Months)

This table reports the average monthly return for winner-loser portfolio in the holding period both before and after the Non-tradable Share Reform. The holding period is set to be 12 months. W-L shows the difference of return rates between the winner and loser. T-statistics test whether the returns are reliably different from zero. Panel A shows the result before the stock reform. Panel B shows the reuslt after the stock reform. Panel C shows the result of the full time period. All the results are in percentage.

| | Panel A:Average Monthly Returns In The Holding Period (2000.04~2005.04) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | Std | 2001 | Std | 2002 | Std | 2003 | Std | Total avg ret | Std |
| Winner | -0.1636 | 0.0927 | -0.0839 | 0.0629 | 0.0698 | 0.1654 | -0.1025 | 0.1341 | -0.0663 | 0.1461 |
| Loser | -0.2609 | 0.1658 | -0.0448 | 0.1012 | 0.0572 | 0.0858 | -0.2144 | 0.1941 | -0.1043 | 0.1862 |
| W-L | 0.0973 | 0.1483 | -0.0391 | 0.0739 | 0.0126 | 0.1444 | 0.1119 | 0.1367 | 0.038 | 0.1382 |
| t | | | | | | | | | 1.67 | |

| | Panel B:Average Monthly Returns In The Holding Period (2008.01~2011.12) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | Std | 2009 | Std | 2010 | Std | | | Total avg ret | Std |
| Winner | 0.1816 | 0.2069 | -0.0159 | 0.131 | -0.2497 | 0.2176 | | | -0.0079 | 0.2498 |
| Loser | 0.5209 | 0.3791 | -0.0113 | 0.164 | -0.1738 | 0.0846 | | | 0.1379 | 0.3887 |
| W-L | -0.3393 | 0.2945 | -0.0046 | 0.176 | -0.0759 | 0.1541 | | | -0.1458 | 0.2632 |
| t | | | | | | | | | -2.77 | |

| | Panel C:Average Monthly Returns In The Holding Period (Full Time Period) | |
|---|---|---|
| | Total avg ret | Std |
| Winner | -0.1055 | 0.2639 |
| Loser | -0.1164 | 0.4194 |
| W-L | 0.0109 | 0.2825 |
| t | 0.42 | |

both before and after the Non-tradable Share Reform. The empirical test resultd shows that either momentum or reversal effect is insignificant in the full time period.

## Ⅴ. 2.2 The Stock Returns In the Post-holding Period

Table Ⅶ reports summary statistics of the monthly return rate for momentum strategies in the post-holding period after the 12 months holding period. Panel A presents the momentum portfolio returns before the implementation of the Non-tradable Share Reform. The total average monthly return of the winner's portfolio in the post-holding period is -0.08%, whereas the total average monthly return of the loser's portfolio is -0.02%. The evidence is inconsistent with the idea that before the Non-tradable Share Reform, a momentum profit can be generated in the Chinese stock market. Here, the result indicates that when the holding period is extended to 12 months, returns are significantly reversed in its post-holding period. In Panel B, it reports the momentum portfolio returns after the implementation of the Non-tradable Share Reform. With the total average monthly return rate of winner's portfolio, -0.058%, and the total average monthly return rate of loser's portfolio, -0.05%, it shows that in the post-holding period, the returns on winner-loser portfolio after the Non-tradable Share Reform is still significantly reversed. Panel C presents that in the total 10 years, the winner-loser portfolios both before and after the Non-tradable Share Reform result in a reversal effect, but it is not significant.

**Table Ⅶ**
**Average Monthly Returns in the Post-holding Period (12 Months)**

This table reports the average monthly return for winner-loser portfolio in the holding period both before and after the Non-tradable Share Reform. The holding period is set to be 12 months. W-L shows the difference of return rates between the winner and loser. T-statistics test whether the returns are reliably different from zero. Panel A shows the result before the stock reform. Panel B shows the reuslt after the stock reform. Panel C shows the result of the full time period. All the results are in percentage.

| | Panel A: Average Monthly Returns In The Holding Period (2000.04~2005.04) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | Std | 2001 | Std | 2002 | Std | 2003 | Std | Total avg ret | Std |
| Winner | -0.0435 | 0.1001 | -0.0128 | 0.1237 | -0.1762 | 0.131 | -0.0793 | 0.0369 | -0.0778 | 0.1278 |
| Loser | -0.0437 | 0.1297 | 0.0151 | 0.1252 | 0.0268 | 0.1317 | -0.1752 | 0.0532 | -0.0219 | 0.1349 |
| W-L | 0.0002 | 0.0642 | -0.0279 | 0.0588 | -0.203 | 0.0497 | 0.0959 | 0.0505 | -0.0559 | 0.1165 |
| T | | | | | | | | | -2.02 | |

| | Panel B: Average Monthly Returns In The Holding Period (2008.01~2011.12) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | Std | 2009 | Std | 2010 | Std | | | Total avg ret | Std |
| Winner | 0.0232 | 0.1983 | -0.0803 | 0.1726 | -0.1187 | 0.1041 | | | -0.0586 | 0.1779 |
| Loser | -0.0178 | 0.2022 | -0.0213 | 0.1546 | -0.0962 | 0.1001 | | | -0.0451 | 0.1612 |
| W-L | 0.041 | 0.0851 | -0.059 | 0.0684 | -0.0225 | 0.0408 | | | -0.0135 | 0.0851 |
| t | | | | | | | | | -2.55 | |

| | Panel C: Average Monthly Returns In The Holding Period (Full Time Period) | |
|---|---|---|
| | Total avg ret | Std |
| Winner | -0.0815 | 0.2637 |
| Loser | -0.0579 | 0.2888 |
| W-L | -0.0236 | 0.1199 |
| t | -1.77 | |

# Ⅵ. Potential Explanations

The arguments about the reasons that gave rise to momentum and reversal effects have never stopped since these phenomenon were first discovered. A variety of explanations from either the traditional efficiency market aspect or the behavioral finance aspect has been noted. All the previous studies have been discussed in Part Ⅱ in this paper. Among all the studies mentioned before, behavioral literature provides very convincing explanation for my findings of momentum and reversal effect after the Non-tradable Share Reform. According to behavioral literature, investors tend to either underreact or overreact when dealing with stock tradings.

Specifically, in the Chinese stock market, up to ⅔ of the total number of 719.4 billion stock shares traded were non-tradable by the year of 2004. This structure of the Chinese stock market caused lots of problems such as lack of transparency and liquidity. Under such an inefficient equity market, investors tended to be irrational towards stock prices. Thus, momentum strategies of buying past winners and selling past losers can be used to gain positive profits. However, as presented in Table Ⅰ, after the Non-tradable Share Reform was completed, which aims to improve the liquidity of the stock market, approximately 1.5241 million stock shares were transferred from non-tradable to tradable, with a changing rate of 42.23%. The improved liquidity and transparency helped more and more information about the fair stock prices to be revealed. Hence, stock prices will turn back to its fair value, with momentum effect disappearing and the appearance of reversal effect.

The above explanation can be observed in the following figures. Figure Ⅰ and Figure Ⅱ show the pattern of momentum strategies before and after the Non-tradable Share Reform. Figure Ⅰ stands for the pattern of the first
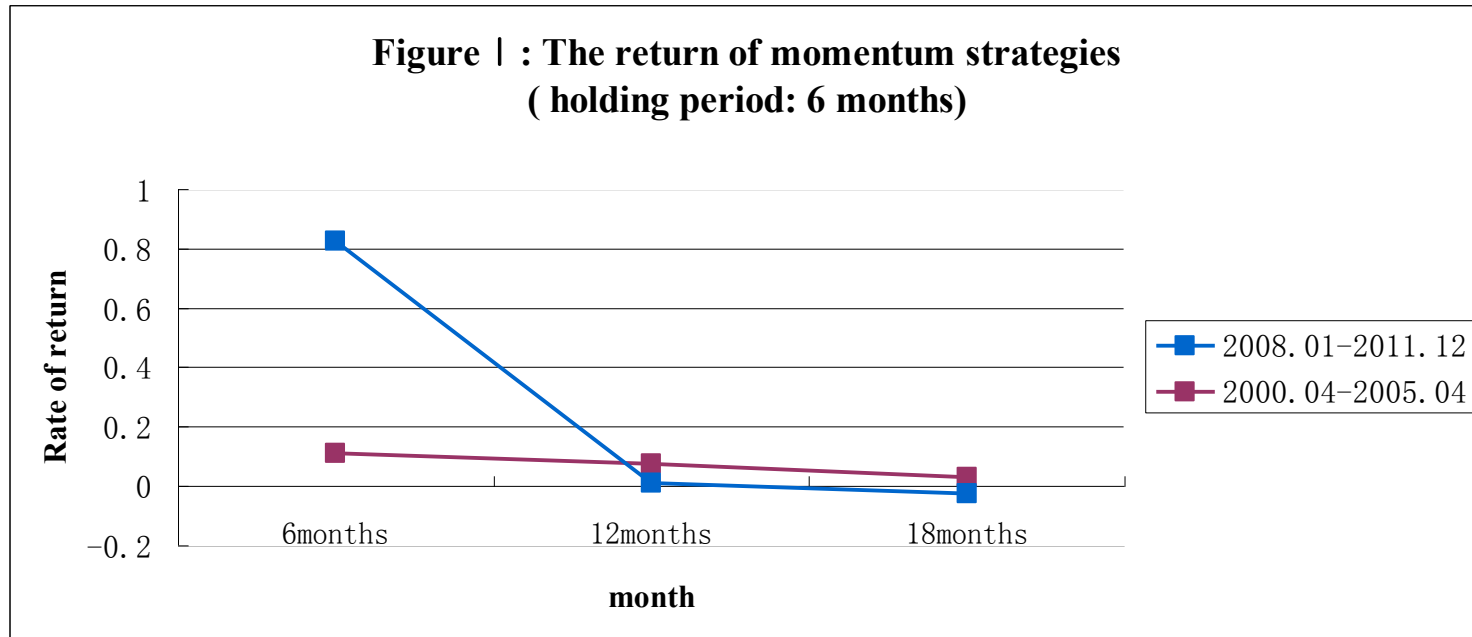
**Figure Ⅰ: The return of momentum strategies with 6 months holding period.** This figure shows the pattern of momentum strategies in the formation period (6 months), holding period (12 months) and post-holding period (18 months). 2000.04-2005.04 presents the time period before the Non-tradable Share Reform. 2008.01-2011.12 presents the time period after the Non-tradable Share Reform.
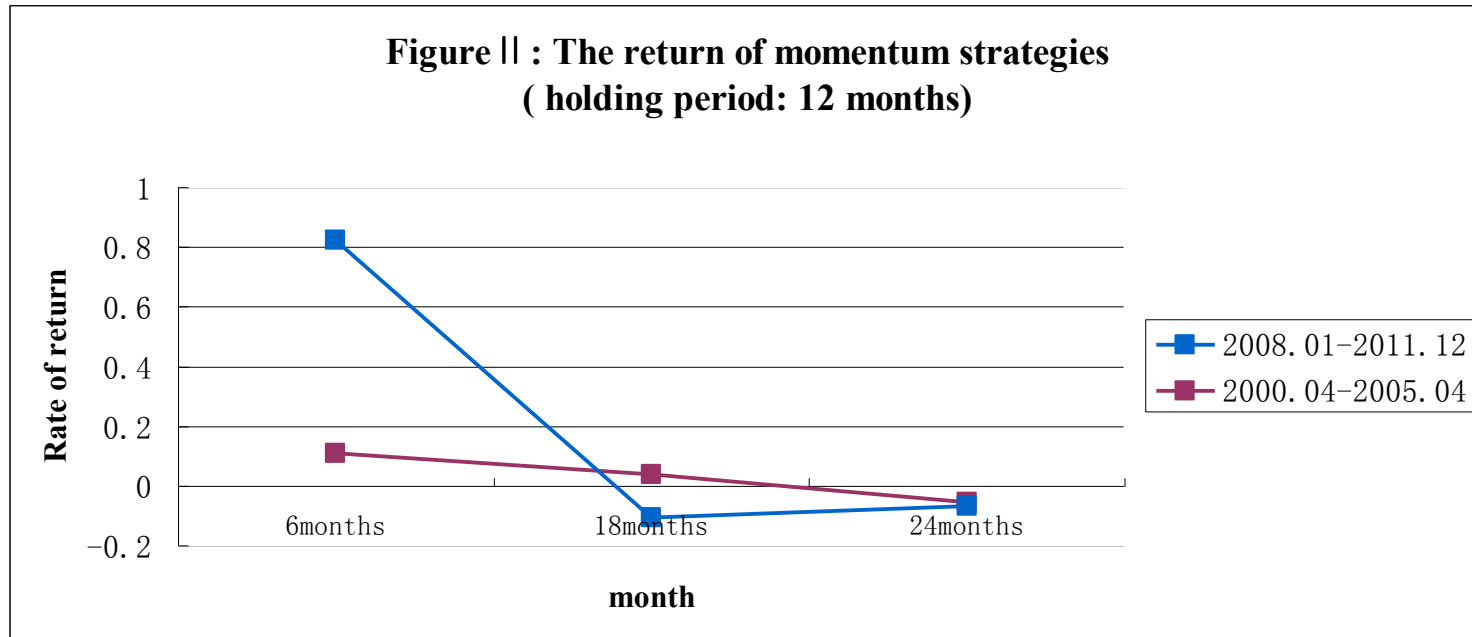
**Figure Ⅱ: The return of momentum strategies with 12 months holding period.** This figure shows the pattern of momentum strategies in the formation period (6 months), holding period (18 months) and post-holding period (24 months). 2000.04-2005.04 presents the time period before the Non-tradable Share Reform. 2008.01-2011.12 presents the time period after the Non-tradable Share Reform.

empirical test, when the holding period is set to be 6 months. In the time period, 2000 to 2004, winner-loser portfolio keeps gaining positive profits in the holding period (12 months) and post-holding period (18 months). It indicates that momentum strategies work in this time period. However, in the time period 2008 to 2012, winner-loser portfolio keeps suffering from a negative profits in both the holding (12 months) and post-holding (18 months) period. It indicates that instead of momentum strategies, contrarian strategies appear in this time period. Figure Ⅱ is consistent with  Figure Ⅰ, except that the holding period is set to be 12 months.

# Ⅶ. Summary and Conclusions

For either portfolio managers or individual investors, having a good understanding of  momentum strategies and contrarian strategies will not only help them make better investment decisions, but also have more knowledge about market efficiency. There are a number of studies working on these topics since the momentum theory and contrarian theory were first documented. Meanwhile, in the past ten years, the Chinese equity market has undergone large changes in order to establish and maintain a sound and health investment environment for investors. The Non-tradable Share Reform is one of the most important reforms that was implemented from May 2005 to December 2007. It is believed that after this reform, the Chinese stock market has become more efficient and healthier than before. Combining these two background issues, I'd like to take a close look at the efficiency of the current Chinese stock market by doing an empirical study on the profitability of momentum strategies before and after the Non-tradable Share Reform.

The analysis in my paper demonstrates the following three main results:

1. My result shows that when holding the winner-loser portfolio for 6 months, there exists a significant momentum effect in the holding and post-holding period before the Non-tradable Share Reform was carried out. The momentum effect disappeared after the Non-tradable Share Reform, and was replaced by a significant reversal effect.

2. My result also shows that when holding the winner-loser portfolio for 12 months, there exists a significant momentum effect in the holding period before the Non-tradable Share Reform was carried out. However, as time passed by, the returns were reversed in the post-holding period. The momentum effect disappeared after the Non-tradable Share Reform, and was replaced by a significant reversal effect.

3. My analysis mainly focused on the momentum portfolio evaluation suggested by Jegadeesh and Titman (2001), where they provided support for the behavioral theory to explain the momentum and reversal effects. The results in my paper shows that before the Non-tradable Share Reform, the trading environment is so inefficient that investors tended to be irrational to the stock prices. It leads to significant momentum profits. After the Non-tradable Share Reform, with more and more information about the fair stock prices being revealed, owing to the improved efficiency of the Chinese stock market, stock prices turn back to their fair values. Hence, momentum effect disappeared, and the returns are reversed.

However, as is pointed out in Jegadeesh and Titman's paper (2001), the behavioral modes only provide at best a partial explanation for the momentum anomaly, there must be other explanations behind the momentum and reversal effects in the Chinese stock market. Chances are that other changes aroused in the past few years, along with the ratio change of non-tradable and tradable stock shares, may also have a high correlation with the weakening of the momentum effect, and the signs of reversal effect. All these questions need to be studied and solved in further studies.

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# 국문초록

본 논문은 중국주식시장을 대상으로 2005 년 5 월부터 2007 년 말까지 실행된 주식시장개혁 전후에 주식시장 모멘텀 전략 (momentum strategies)의 성과를 살펴보는데 목적이 있다. 중국주식시장에 거래된 주식은 유통여부에 의해 크게 유통주 및 비유통주 두 가지로 나뉘어 있다. 비유통주는 큰 비중을 차지하고 있었으며 시장 효율 저하 및 거래 불투명 등 중국주식시장의 여러 문제를 일으켰다고 발견되었다. 그러므로 2005 년 5 월부터 2007 년 말까지 중국정책당국은 비유통주의 유통화를 목적으로 해서 주식시장개혁을 실시하였다. 선행연구에 따르면 모멘텀 투자 전력 및 역행투자전략 (contrarian strategies)의 성과가 시장효율성과 밀접한 관계를 맺고 있으며 시장구성에 따라 다양한 형태가 나타날 수 있다 하였다. 따라서 본 연구는 2000 년~2004 년 (개혁 전)과 2008 년~2011 년 (개혁 후) 두 기간으로 나누어서 중국주식시장에 모맨텀 현상 (momentum effect) 및 역전 현상 (reversal effect)이 존재하는 지에 대해 분석해 보고자 하였다. Jegadeesh and Titman (1993)에서 소개된 J/K Months 방법을 활용하여 6 개월 구성기간 및 6 개 월과 12 개 월의 보유기간 포트폴리오를 구성했으며 실증연구를 실행하였다. 분석한 결과는 2000 년~2004 년 (개혁 전) 기간에 중국주식시장에 뚜렷한 모멘텀 현상이 나타났으며 2008 년~2011 년 (개혁 후) 기간에 모멘텀 현상이 사라졌고 역진 현상이 유의하게 나타났다고 발견되었다.

또한 결과에서 모멘텀 현상이 일어났다가 사라진 것은 투자자들의 비효율적인 행동을 일으킨다고 나타났다. 즉 비유통주의 유통화 개혁을 실시하기 전에 시장이 비효율적이기 때문에 투자자들은 주식가격에 대해 과잉반응 (overreaction) 혹은 과소반응 (underreaction) 등 비효율적인 감정을 가지고 있는 관계로 과거에 수익률이 높은 주식이 더 높은 가격으로 올라가게 만들고 과거에 수익률이 낮은 주식이 더 낮은

가격으로 내려가게 만들었다. 두 가지 포트폴려오의 차이는 바로 모멘텀 전략의 수익이다. 반대로 비유통주의 유통화 개혁 후에 시장효율이 높아지기 때문에 주식가격은 기초적인 가격(fundamental price)으로 되돌아가 주식가격의 역전 현상이 나타났다.