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WINNERS-LOSERS LONG TERM REVERSAL
IN THE
CHINESE STOCK MARKET

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By

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Dedication

For my amazing family who has been by

my side every step of my life. Thank you for

supporting me throughout my studies.

Acknowledgement

Abstract

This paper shows that contrarian strategy is applicable for trading long term in China's stock market. This was due to evidence that China's stock market showed a winner-loser long term reversal. It was found that a zero investment portfolio that buys the past 36 months' loser stocks and short-sells the past 36 months' winner stocks produced positive profits due to the reversal effect. After the 36-month holding period, past loser stocks gave higher monthly mean returns than past winner stocks. This was especially evident for Type A stocks and stocks from the Shanghai Stock Exchange (SSE). The reversal was due to overreaction factors. The way investors received and used information influenced the reaction they had towards news and their actions in trading. This also posed a challenge to market efficiency. In addition, there was also a possible value-growth characteristic attributable to the stocks traded in China. Furthermore, analysis using the book-to-market ratio showed that high book-to-market stocks (which were usually loser and value stocks) gave higher monthly mean returns than lower book-to-market stocks (which were usually winner and growth stocks). The reversal did not seem to be concentrated only on the month of January due to the tax avoidance incentives; making the contrarian strategy applicable throughout the whole year.

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1. Introduction

One often ponders about how financial markets work and how some people keep gaining and some seem to have no luck. Does luck have anything to do with it? Or, is it just having the right information at the right time? And what defines the 'right time'? This raises the old question of "Can one time the equity market?" How does the stock market actually perform and is there a systematic way of knowing how the market would react to information? It is well known that stock market returns are never stagnant; going up and down according to companies' performance as well as stockholders' information about the stock and their reaction to this information. There is a growing body of literature about the changes in stock market returns and many authors claim that future market returns are independent of past performance. Much of this literature, however, is still to pass the test of time.

One of the well-known studies that has become one of the important foundations in finance, but remains very questionable, is the study by Fama (1965) called the 'Efficient Market Hypothesis' (EMH). According to EMH, it is almost impossible to get an abnormal return on the basis of information from past returns, even with the aid of publicly and privately available information. However, it is believed that this does not hold true. The stock market is not completely efficient. There are a number of anomalies in stock markets that cause violations of EMH and result in abnormal returns. The contrarian strategy of buying past losers and selling past winners was first analysed by DeBondt and Thaler (1985, 1987). This strategy reflects the winners and losers long term reversals in stock market returns.

The procedure in the current study, adapted from the study by DeBondt and Thaler (1985), includes gathering monthly stock market returns. This study on China's market uses up to date data from between March 1992 to November 2010. Portfolios are formed each month with a formation period of 36 months before and an assumed holding period of 36 months after. When the portfolio is formed, the winner and loser stocks will be determined, based on their mean returns. Stocks with the highest returns are classified as winners and those with the lowest are classified as losers. The contrarian strategy suggests that winners should be sold and the losers bought. This strategy is maintained throughout the 36 month holding period. The performances of the stocks are then compared. This is undertaken for all the portfolios created and then the mean returns for the winners and losers are calculated. As expected, the winning stocks have lower mean returns and losing stocks have higher mean returns.

2. Research Problem

Is there a violation of the Efficient Market Hypothesis (EMH) through the 'winners-losers long term reversal' situation, existing in China's stock market?

2.1. Violation of EMH

EMH suggests that it is impossible to get abnormal returns based on information available from the past. For example, if there is information that the price will always go up in December, investors would start buying stocks earlier; at the latest, by November, and hold them until December before selling them and obtaining abnormal returns. However, if this information is available to everyone, the abnormality becomes normal and, hence, in November itself, or earlier, the price will go up due to the high demand and the price will go down in December if all the stocks are sold then. Hence, it is impossible to overcome the market as the efficiency factors in the stock market ensures that the share prices always reflect the information known to the investors. Therefore, according to the EMH, stocks will always trade at their fair value and will give normal returns. It seems it is not possible for investors to take advantage of the news and purchase undervalued stocks or sell stocks for inflated prices with the right timing to achieve higher returns than usual. Over the years investors, have believed that EMH restricts their ability to earn abnormal profits. However, research for over a decade has found that momentum and reversals exist and these situations violate the EMH at its most basic level; where in a weak-form efficient market, the performance of portfolios of stocks should be independent of their past returns. Two recent approaches to investments that have challenged the weak form of the EMH are the momentum strategy and the contrarian strategy which complement the reversal effect. These strategies are based on information from past returns of the stocks. The intermediate-term momentum effect was found by Jegadesh and Titman (1993). The short term reversal effect was introduced by Jegadesh (1990) and the long term reversal effect was first analysed by DeBondt and Thaler (1985).

3. Previous Study on Long Run Reversal and a Rationalisation of the Phenomenon

DeBondt and Thaler (1985) compared the performance of two groups of US stocks, extreme losers and extreme winners, over the period from 1933 to 1982. For each year since 1933, they formed portfolios of the best and the worst performing stocks over the previous three to five years, and then computed the returns of these portfolios over the next three to five year holding period. They showed that over those holding periods, stocks that performed poorly previously achieved higher returns than stocks that performed well over the same period. They found that losers outperformed the market by 19.6% per annum, on average, while winners underperformed the market by 5.0% (Gunasekarage & Kot, 2007). DeBondt and Thaler (1985) concluded that stocks that performed well in the last three to five years (winner stocks) will perform badly in the next three to five years, and vice versa. They argued that over time, stock prices overreact; the extreme losers will become too undervalued and this will result in higher than expected average returns in the future. In contrast, the extreme winners will become too expensive and will give lower than average returns. If the loser does well in the coming three to five year holding period, even better than the winner's performance and is, potentially, able to give abnormal returns; the contrarian strategy of buying the previous three to five year losing stocks and selling winners will be useful.

How does this work? When there is news that the stock will do well, investors will usually under react, hence, not push the price up high enough (Barberis and Thaler, 2000, p.1093). Therefore, a short run momentum will occur when the price will be too low as compared to its earnings and that results in the stocks giving higher than average returns.

Edwards (1968) introduced this phenomenon as 'conservatism'. People are slow to react to the evidence given in the news so the price of the stock now would not reflect the information available. The same happens when bad news about good stocks is undermined and results in lower average returns. People would like to believe that if a company is doing well, they must continue with this success in the future. After a series of these phenomena, investors will then learn their lesson but will then overreact to the news. With good news, people will overreact and push the price up far too high but realise it is too good to be true, resulting in lower average returns, subsequently. With bad news, investors will overreact in such a way that it undermines the potential of the stock, but it turns out that they are doing better than expected. This phenomenon is identified as a long term reversal.

3.1.Study of Long Run Reversal in China's Stock Market

The most important part of the study is to find evidence that there is EMH violation in China's stock market through long run reversals. The results of this study are beneficial if China's stock analysts/investors to take into account the winners-losers reversal effect while investing in China's stock market. It is essential then to see whether the winner- loser long term reversal is applicable in this stock market and to what degree it is useful in predicting future returns. It provides evidence to prospective investors about the potential for a winners-losers long term reversal situation that can be used to beat the market. Consequently, this will enable advice be given to investors of China's stocks to follow the simple contrarian strategy of buying stocks that were losers in the last three years, so that they can earn superior returns. Hence,

this will boost confidence in investing in China's stock market. This is because if the effect of the long run winners-losers reversal holds true, the market is seen as predictable and strategizing would work. From a wider perspective, this study shall impact market efficiency and the methods that will be used in pricing assets (Chaudhuri & Wu, 2003), especially those in China.

Furthermore, since this type of study has been carried out in the US and the UK (Yuliang & Youwei, 2010), it raises fears about overreaction due to data snooping that cause biases (Dissanaike, 1999). Therefore, it is of interest to widen this study to Asia to further validate this phenomenon. China is large market that is rising and becoming a dominant influence in the world's economy. China seems to be a good representation of Asia due to the rising economic power it has nowadays. Existing studies have concentrated on the developed markets, and yet previous researchers have found different results in different markets (Chaudhuri & Wu, 2003). In a study by Liu and Lee, where they tried to see whether the Japanese stock market had evidence of the momentum strategy; they found that Japan has a reversal effect instead (2001). In contrast, a study done for the New Zealand stock market showed that momentum won and it appeared that reversal appeared infrequently in that market (Gunasekarage & Kot, 2007). These differences could be explained by the culture of the market. The New Zealand market concentrates very much on property and since property is, relatively, a much more stagnant market, the winners will keep on winning and the losers will keep on losing. However, this might change due to the earthquake that hit one of the country's main cities; Christchurch. In contrast, in Japan's market; where the focus is on technology advancement, one company had the motivation to pass the winning company and become the leader of innovation to sustain a technology-based industry with a high obsolescence rate. This is, however, an

unproven opinion. Even though these studies were short to intermediate term, we can say that the strategies that can be applied due to the violation of EMH might not be applicable universally. Hence, the evaluation needs to be carried out on a country by country basis. Therefore, using the emerging market of China enhances studies in this field. This paper will empirically prove that China has similar results to those studied by DeBondt and Thaler, in 1986, for the US market. Furthermore, it also develops further arguments relating to the view that EMH does not hold true and that the education syllabus taught to finance students should be updated so they become very much aware of these situations.

3.2. Research Question

Does the winners-losers long term reversal situation exists in China's stock market?

4. Potential Causes of EMH Violations

4.1. Behavioural Issues in Stock Trading

The reversal phenomenon starts with common behaviour that can be seen when trading in stocks. When investors are faced with making a decision, which is usually based on past performance (George & Hwang, 2007) and other information available, they tend to fall prey to one of two well-known heuristics: the hot (cold) hand and the gambler's fallacies (Johnson, Tellis & MacInnis, 2005). Hot hand is when a rising (falling) trend is predicted to follow the random sequence of the previous data. Gambler's fallacies are when individuals project a reversal outcome based solely on the data and instinct. In 1972, Kahneman and Tversky

suggested that both these heuristics arise from consumers' beliefs that small samples are representative of the underlying process (Johnson et al., 2005) for predicting a trend. It is human behaviour to believe that when a random sequence shows a pattern, consumers will assign meaning to it believing that it is real (Johnson et al., 2005). Gilovich (1991) explains that this misconception is then added to their pre-existing theory and creates biases in making future decisions (Johnson et al., 2005).

The theory of hot (cold) hand further supports the idea that EMH is, indeed, being violated as trends are being used to make decisions and inducing the outcome. When a stock is hot, i.e. doing well over the past few years; consumers who have been looking at this random sequence of events will interpret it as a trend and, hence, will determine that the stock will be doing fine for the next few years (Johnson et al., 2005). Investors will then become overly optimistic about that particular past winner (Johnson et al., 2005). When many investors become overly optimistic about the stock, they will tend to overestimate its potential and value to grow (George & Hwang, 2007). This will then overvalue the stock price due to the high demand that this phenomenon has caused. The theory of cold hand suggests the opposite of hot. Losers over the past few years that have had declining earnings will not be popular among investors because of the perception that they will not do well in the next few years. Therefore, the stock price will be very much undervalued because no one had faith that it will bounce back.

In contrast, investors who believe in the gambler's fallacy will do the opposite of what the past performance suggests. Tversky and Kahneman (1971) in their study believe that people

hold on to the idea that in the long term, the probability of the hot (cold) theory will diminish (Johnson et al., 2005). It is true that if an investor has both positive and negative earning stocks, he will tend to sell the negative trending stocks. However, as time goes on and the length of the trend increases, the investor would want to believe that there is a likelihood of a reversal (Johnson et al., 2005). Moreover, with this hope, investors will also tend to hold losers too long and sell winners too fast (Johnson et al., 2005).

This study will predict, if a reversal occurs in the market or not, so that one will not fall into a hot (cold) hand or gambler's fallacy. DeBondt and Thaler (1985) explain in their paper that investors should buy the past three years' losers and sell past three years' winners. This goes against the hot (cold) hand theory; which is a mistake commonly made by investors. With this study we can also help investors avoid falling into the gambler's fallacy because one will then have a better idea of the right time to sell and buy.

4.2. Information Dissemination and Assimilation

There are too many factors that connect a piece of information to the reaction. EMH can be violated by the fact that there are diverse means for information to be disseminated and assimilated by investors (Balsara & Zheng, 2006). Information about a stock is believed to be spread in an epidemic manner. This means that it will be mainly based on how many contacts per unit the informant has and how important the information is being relayed (Balsara & Zheng). With larger and more important information, there is stronger urgency to relay the message. Furthermore, simply because information has been disseminated quickly does not

mean that it will be used or immediately assimilated by all investors (Balsara & Zheng, 2006). What is more important is the degree of willingness by investors to absorb the information and use it in making buying or selling decisions (Balsara & Zheng, 2006). This is consistent with Daniel et al.' s (1998) study that suggests investors' overconfidence and self-attribution play a role in the timing of the absorption and use of the information. Humans have the tendency to be overconfident after a series of good outcomes. In contrast, the rare occasion of bad outcomes will only be associated with bad luck. This is especially true for investors with a series of good outcomes. It is believed that all good outcomes have to be because of the skills that the investor might (or might not) have, which potentially increases risk taking due to overconfidence. The investor will then not learn from unsuccessful outcomes and will forever be overconfident, which results in unrealistic assessments in decision making. Therefore, when the information is available it is not necessary for this type of investor to believe immediately and act on the information. It will, instead, cause an overreaction to occur when they finally come to terms with the news.

5. Literature Review

5.1. Cause of Reversal 1: Overreaction

There is already evidence that long-term stock return reversals exist in developed and developing markets (Yuliang & Youwei, 2010). Some countries where reversal effects have been documented are Japan, Taiwan, Malaysia, Spain, Brazil and Sri Lanka (Gunasekarage & Kot, 2007).

In EMH, it is believed that all the information available to investors makes it impossible for them to gain abnormal profits. However, as an extension to the dissemination and assimilation theory discussed above, there are also psychological concepts that are similar to Daniel et al. (1998), as introduced by Barberis et al. (1998), called "the representativeness heuristic" and "the conservatism bias" which investors inherently experience when interpreting new information (Yuliang & Youwei, 2010). A representative heuristic suggests that humans give higher probability of an event occurring based on whether a similar occurrence has happened in the past. People tend to compare the likely event using their past experience to make a similar decision. The experience will have some associated meaning attached to it that assists in classifying things when encountering similar situations, thus creating belief that the probabilities will be similar. This is followed by the conservatism bias where investors are too slow to update their beliefs in response to recent information. This means that they might initially under react to news about a firm, so that prices will reflect the new information only gradually. These two theories suggest that the initial under reaction causes the momentum and the later corrected perception causes the overreaction, which leads to a reversal (Wu & Li, 2010). When investors correct their priorities, they will experience overreaction in the long term. People take their time to react and sometimes they also reacted with resistance and resilience that causes under reactions. These concepts explain why EMH would not work immediately. Therefore, when EMH does not work perfectly, we can say that there is a chance that we can predict future stock performance on the basis of past information. Hence, applying the contrarian strategy in a long term-reversal situation is possible.

DeBondt and Thaler (1985) explain that if long term reversal effects exist in the market, there is a chance that if we buy the previous three years' losing stocks and hold them for three to five years, it will outperform winning stocks by 25% (George & Hwang, 2007). This was seen evident in their previous studies on the US market. DeBondt and Thaler (1985) also explain that the reversal strategy is very much connected to the overreaction phenomenon (George & Hwang, 2007). The behavioural explanations above should strengthen our understanding of overreaction as the cause of reversal. When people receive news about the stock, they make systematic mistakes when reacting to it. This phenomenon is explained by the self-attribution concept where people only hear or believe what they want to believe, hence, making them react to news more slowly, especially when it is not extreme. They also believe in their self-claimed ability to predict future trends based on their own evaluations of past performances. This is when the hot (cold) hand theory comes in. Investors refuse to believe that winners can also perform badly and the losers can rise. We know that human behaviour induces the natural instinct to buy past winners and sell past losers. Institutions have been seen to be buying stocks with the highest previous returns and avoiding stocks with the lowest previous returns (Gutierrez Jr. & Prinsky, 2007), regardless of the news or, possibly, a slow reaction to it. Therefore, investors are seen as overestimating the winners and underestimating the losers as a result of a slow reaction to the news. Then, after taking their own time, they will finally adjust to the news and have the tendency to overreact (Yuliang & Youwei, 2010). Overreaction here is happening because the news has actually become old and the reaction that has finally come to the investors' senses was a little too late. The peak of overreaction to good news is likely to occur when stocks have reached a long-term high, when the good news is about to expire, and

the peak for overreaction to bad news is when the prices are near long term lows (George & Hwang, 2007). Thus, this makes the reversal of stock performances most likely to occur after those peaks. Therefore, reversal happens when investors learn from the past that the overreaction did not bring them an abnormal profit (Yuliang & Youwei, 2010). Bayesian learning models suggest that investors put too much weight on extreme observations that may generate overreaction in beliefs about both good and bad news. Reversals occur when investors learn that they overreacted in the past (Wu & Li, 2010). Since it is believed that investors learn from their past reactions and, subsequently, change their decisions resulting in a reversal, it is important to assess whether overreaction does impact the reversal and whether those investors actually learn from that past overreaction or not.

However, it has to be noted that long term-reversal is likely to arise only when markets include a sufficiently large number of traders who are willing to trade on the basis of price movements alone. Individuals are said to have the tendency to be contrarian traders due to contradictory information they possess (Bloomfield, Tayler & Zhou, 2009).

5.2. Cause of Reversal 2: Tax Avoidance Incentives

The above discussion mainly focuses on the potential behavioural reasons of how reversals can occur. In extension to those discussions, we now consider rational explanations. One of the rational explanations for this reversal phenomenon is the investors' rational behaviour to strategically avoid tax (George & Hwang, 2007; Wu & Li, 2010). Investors holding winners are reluctant to immediately sell their stocks as selling these stocks will realise capital

gains and capital gains tax will need to be paid (George & Hwang, 2007; Wu & Li, 2010). The higher the appreciation of the stocks, the higher the gain will be, but the higher will be the tax on the gain (Wu & Li, 2010). The investors will sell those winning stocks if the selling prices are marked up to cover the tax, making the price of the winners rise to the point of being overvalued. However, this price would not reflect the true intrinsic value of the stocks and so would have lower returns than expected (George & Hwang, 2007). The question is, knowing this, who would want to buy the highly marked up stocks? It is believed that as time passes there will be buyers who are willing to, and can, take the risk to pay the marked up prices to obtain the embedded gains in the stocks (George & Hwang, 2007). Also, as investors with a locked-in gains approach at the end of their investment period, the benefit to further defer taxes on gains decreases (George & Hwang, 2007) making them eventually sell off the stock. The new owners, however, will realise that the embedded gain is not as high as the value paid; hence they would be willing later on to sell without demanding large premiums (George & Hwang, 2007). When this happens the stock will reduce to its real value and to a real perception of its actual earnings. The correction for the overreaction occurs and, by right, stock returns should then exhibit reversals in the long term (Wu & Li, 2010).

One of the important implications from previous studies is that the incentive to avoid tax seems to be more applicable to winner stock reversals as investors are reluctant to pay capital gains tax and, therefore, losers seem to be earning more by having higher reversals mostly in January (Wu & Li, 2010). However, if an investor incurs any capital loss in the previous tax-year, the amount of loss has a "carry over" feature that can offset current or future capital

gains. Losers should have positive returns in January, a notion that investors use to exploit losers to establish tax-loss positions at the end of the tax year (Wu & Li, 2010).

Analysis on reversals, excluding the month of January, is undertaken to check whether a tax avoidance incentive is applicable to China's stock market reversal. It is seen that when the month of January is excluded, the reversal still remains strong and so the reversal in China's market could not be explained using tax avoidance reasoning. This is despite the fact that China not imposing capital gains tax. By right, when capital gains tax is imposed, the market is highly influenced by the incentive to avoid tax so the reversal should occur often in the month of January. Therefore, if January were to be taken out from the analysis, the reversal should have much less an effect or even be absent. This is proven in a study on the Hong Kong market where capital gains tax is non-existent. Hong Kong did not show any reversal with or without the month of January included (George & Hwang, 2007). With no capital gains tax, there was no reversal in the Hong Kong market (Wu & Li, 2010). The opposite is obviously found in China's market as it does have capital gains tax. Therefore, an analysis excluding the month of January shows that there is a lower reversal effect; the significance of this will be discussed later in the results.

5.3. Cause of Reversal 3: Value-Growth Characteristics

Value-growth characteristics are believed to provide better explanations for long term stock returns (Wu & Li, 2010; Yuliang & Youwei, 2010). The intrinsic value of a stock can be measured using the book-to-market value of the stock (Wu & Li, 2010). This is a ratio where the book value is divided by the market value. A ratio higher than 1 is considered high and most

likely means the stock is undervalued and if the ratio is less than 1 (which is considered low), it is potentially overvalued. Book-to-market is one of the variables used to capture financial distress (Piotroski, 2000). A high book-to-market means that there is a tendency that the company has higher costs in covering its financial distress and, hence, will be seen to be pessimistic about having poor future earnings. This then makes the high-book-to market stocks tend to be undervalued. However, they will achieve a higher mean return because, according to Fama and French (2006), they should have returns that can compensate the additional systematic risk carried (Piotroski, 2000; Wu & Li, 2010). Therefore, high-book-to-market stocks would have a high expected return relative to low book-to-market stocks that have, on average, a low distress cost (Wu & Li, 2010). This then has caused the high book-to-market stocks to outperform low book-to-market stocks (Piotroski, 2000). An analysis separating China's stocks into low and high book-to-market ratios shows the argument is true.

For the analysis of the high-low, book-to-market ratio, the winners and losers of each respective group are analysed again to see the reversals in their returns. Winners are more likely to be growth stocks, while losers are usually value stocks (Wu & Li, 2010). If a stock is measured by value, it means that its intrinsic value is measured according to recent changes in the firms' fundamentals, using historical financial statements (Lander, 2006). In contrast, the growth stocks are generally overvalued (Wu & Li, 2010). This is a result of the mismeasured relationship between risk and return (Wu & Li, 2010) and market mispricing between the observed return of stocks. When the winner is performing well, there is a momentum effect existing; the investors believe that the stock will remain doing well. This results in the winner stocks being overvalued. The reason behind this is that growth stock is usually measured based

on subjective non-financial information such as forecasts of sale and the resultant cash flow (Lander, 2006).

According to this discussion, the loser (value) stocks should have higher mean returns than the winner (growth) stocks, and these winners and losers under the high book-to-market value should, overall, have higher mean returns than the low book-to-market stocks.

6. Data

The monthly data for this study were collected from the China Securities Market and Accounting Research database (CSMAR). One important question here is how much market data needs to be used? Dissanaike, in his study (1997), includes time-varying risk and restricted his study to 1000 of the larger and better known UK companies, those that are more actively traded (Dissanaike, 1999). He explained that this limitation minimises the biases created by the fact that some stocks are not actively traded and would, therefore, probably not show the reversal effect (Dissanaike, 1999) or any other predictable trend due to insufficient data. Investors also are generally more interested in engaging with information about larger listed companies because they are more attainable (Dissanaike, 1999). Even though this way of doing things might create biases of its own, it is reasonable and should be taken into consideration when choosing the data to include. Therefore, for this study, it is decided to use the monthly returns from two stock markets in China; the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE). The data available from CSMAR that are useful and available for this

study are for the period from March 1992 to November 2010. The total numbers of stocks involved during this research period are 1,015 with total number of 195,990 observations.

These results are analysed in various levels. Firstly, analysis is done for the overall data, and then by the stocks from SZSE and SSE separately, to see which exchange contributes to the reversal the most. Lastly, the analysis will look into whether the results will remain the same when Type A and Type B stocks are separated. Type A stocks are the ordinary stocks that are freely traded in Chinese currency, Renminbi, by mainland residents only while Type B stocks are foreign investment stocks that have a face value in Renminbi but are traded in foreign currencies. These Type B stocks are from overseas, mostly from Hong Kong, Macau and Taiwan and can be traded by both local and overseas investors. The results will also be separated into three time groups. Each time period reflects the economic situation faced by the China stock market at the time. Hence this can, to some extent, explain the impact on the degree of reversal.

7. Method

The method used to see whether this long-term reversal occurs in China's stock market is similar to what DeBondt and Thaler (1986) used in their study of the US stock market's long term reversal.

An examination of the excess return behaviour of winner and loser portfolios will be carried out by taking the monthly returns for the period chosen; March 1992 to November 2010. The profitability of the winner-loser reversal was calculated using a 36 month formation

and holding period return. The first portfolio was formed on March 1995 with a formation period of April 1992 to March 1995. The monthly formation period returns were distributed among ten equally weighted rankings where number (portfolio) one was the 'loser' and number (portfolio) ten was the 'winner'. The performing one was the winner and, at the other end, the one that was not performing well was the loser. The profitability of the stocks were calculated every month for the 36 month formation period and then ranked from winners to losers. The average for each rank was taken to make up the winner and loser for the portfolio. These portfolios were held for another 36 months. For the first portfolio, the holding period was April 1995 to March 1998. The stock returns after the 36 month period were again analysed to give the monthly mean returns and the mean differences between the losers and winners; the reversal effect. The second portfolio was formed on April 1995 with a formation period of May 1992 to April 1995. It was formed on n= March 1995, and for the second portfolio it will be n+1 month and n+2 for the third portfolio and so on. This continued until the last portfolio of n+ 152= November 2007, where the formation period was December 2004 to November 2007; enabling the analysis to be undertaken until the end of the holding period, December 2007 to November 2010, available in the data. The total number of portfolios formed was 153. This was undertaken for all portfolios created and the mean returns for the winners and losers were calculated. As expected, the winner stocks have lower mean returns and loser stocks have higher mean returns. The analysis of the data to calculate the mean return was carried out using Statistical Analysis Software (SAS).

8. Results

8.1. Overall Results

The results are read in terms of mean returns on a per month basis. Using the contrarian strategy of selling the winner and buying the loser, the results showed how much was earned on average by those two portfolios every month after holding the portfolio for a 36 month period. In general, for China's stock market, holding the losers and selling the winners were generally very profitable with 88% to 100% of the months showing reversal. The difference between the loser and the winner was also looked at to see how profitable the strategy was.

In reference to Table 1, 153 portfolios were formed every month for the periods between March 1995 and November 2007. Each month's portfolio winners and losers were held for 36 months and the return was recorded. The mean was calculated for every portfolio's winners and losers returns. It was shown that holding the winners gave a mean return of 1.178% per month as compared to the mean return of 2.432% per month when holding losers. The losers have higher mean returns by 1.254% per month. This proved that reversal did occur in the overall China stock market with, all the 135 months of the winner and loser portfolios being held, 93.15% showing reversal. The following graph shows the mean returns trend for the losers and winners. It can be clearly seen that the losers get higher mean returns most of the time in China's stock market. Even when losses occurred, it can be seen that the losses by the losers were slightly lower, on average, than the winners.
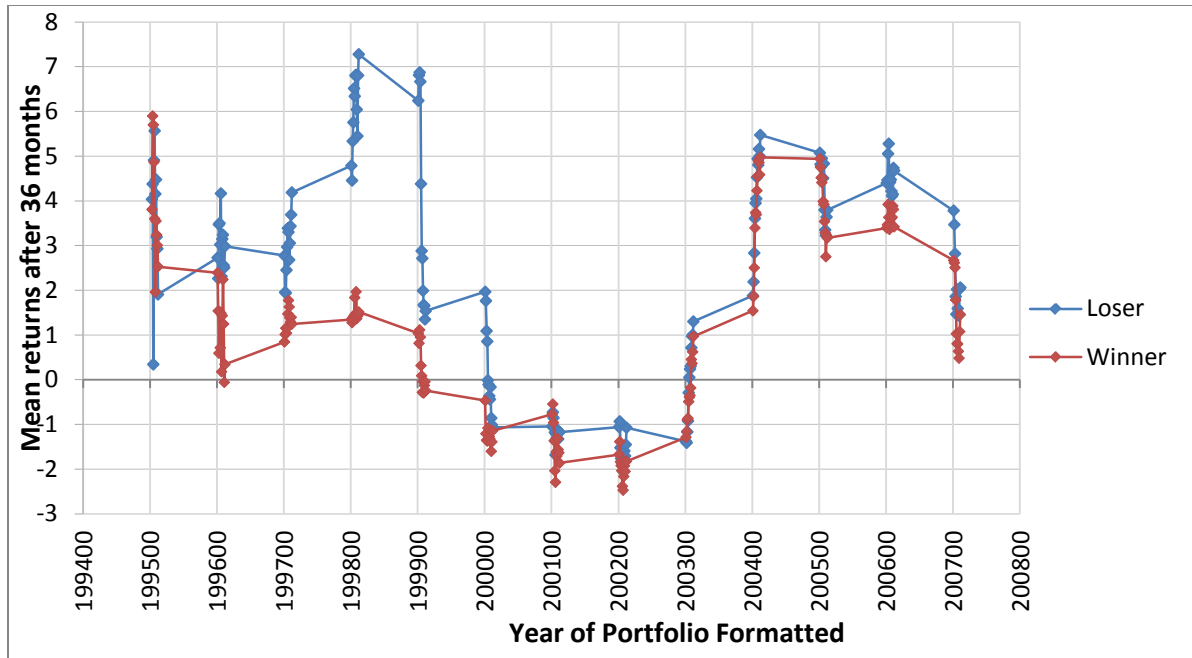
Graph 1: Mean Returns for Loser and Winner Stocks for Long Term period in China's Stock Market

The results were also divided into the data taken from the respective exchanges (refer to Tables 2 and 3 in the appendices). For SSE, the mean winner return was slightly under the overall mean recorded at 1.134% per month and for SZSE it was at 0.976% per month, making it even lower. However, SSE losers had monthly mean returns of 2.594%, slightly higher than the overall monthly mean return of 2.432% and much higher than the mean loser returns for SZSE by 0.519% per month. SSE seemed to have a higher percentage of loser-winner differences, at 1.46% per month as compared to SZSE (1.099% per month) and even higher than from the overall mean difference (1.254% per month), making the exchange a potentially higher contributor to the reversal.

Further, the results were separated into the underlying data made up of Type A and Type B stocks. In reference to Table 4, for Type A stock, the winners' monthly mean return was

1.309% and showed a lower return to the losers' monthly mean returns by 0.802%. The loser for Type A stock showed a higher monthly mean return, at 2.111%, as compared to the mean loser return of Type B stocks, at 1.758%, per month (Refer Table 5). In addition Type A stock showed a higher reversal than Type B stock by 0.413% per month. This showed that Type A would be the higher contributor to the overall reversal.

The reversal analysis for the whole China stock market was also divided into three time periods. Statistically, there was a tendency that of all 153 data used, the reversal only happened at certain periods of time. Therefore, the separation was mainly a means to reduce the statistical bias and reduce the likelihood effect of data snooping biases. The first group was the first two-fifths of the data, the second group was the next two-fifths of the data and the final one-fifth made up the last group. With this separation, the degree of the reversal for each period can be compared and the contribution of each group towards the reversal can be determined. Each time period also reflected the economic situation faced by China's stock market at the time. Hence, to some extent, this explained the impact on the degree of the reversal.

The formation months from March 1995 to December 1999 (Table 6) gave the mean returns for the holding period from *April 1995 and December 2002*. This covered the immediate period of the impact from the Asian financial crises that began in July 1997. The Asian financial crises did not affect China much, as it was during those periods that there was high GDP growth in China, although it slowed down slightly in 1998 and 1999. The growth was attributed to heavy industries, infrastructure rises and cheap labour (Overholt, 2010). China survived the

crises well due to its increased exports. The growth was, however, immediate and had a large

impact but then come to obsolescence too soon (Overholt, 2010) counteracting the rapid

growth and returning to a stable and well to do economy. For this period, it can be seen that

the losers had higher monthly mean returns of 2.353%, more than the average winners'

earnings. From Table 7, the results of the reversals were the mean from *February 2000 to*

December 2007. This included the time when the United States had their recession that also

affected China's export industries. This slowed the growth and worsened China's economy. It

was believed that any slowdown in China's growth would have a large impact on its economy.

Economists have warned that China could face a recession if its growth rate were to slow to

even as low as 6% (Chiu, n.d.). There was also growing worry that at that time China was facing

a bubble waiting to bust (Fleming, 2007). As can see from the results in Table 7, the winners

even had a negative mean return over that time; a mean loss of 0.241% per month and the

reversal was not as high; down by 1.824% per month from the previous group period of

reversal, at 2.353% per month. Furthermore, this period also included the start of the global

financial crisis that cut the price of the Chinese stock market in half (Jubak, 2010). It could be

said, although this has not been proven correct, that when the economic situation was at a

downturn in China, the reversal became less apparent, being the lowest at a 0.529% per month

mean reversal effect. Table 8 shows the return breakdowns in the holding period of *February*

2005 to November 2010. In this period the effect of the global financial crisis had a strong

effect; however, the subsequent recovery quickly took place at a later period making the period

stabilise and pushing the market towards another bubble (Jubak, 2010). As seen in Table 8, the

loser monthly mean return was 3.715% and the winner was close to this, at 3.038% per month.

Both winners and losers seemed to be enjoying the growth and improving economic environment that China was experiencing during this period. In this kind of growing environment, it was seen that the reversal was present in all months.

It seemed likely that when the economy was stable and doing well, the results showed a very high tendency (maybe even at its highest) of reversal, followed by the second highest when it was at a growing period in the economy. Although, in the growth period, both winners and losers seemed to be doing well as their mean returns were similar. The reversal's effect was to be at its least when the economy was facing a slump, although it was still visible and the losers seemed to be doing much better than the losers in terms of getting positive returns. The following graph shows the trend discussed.
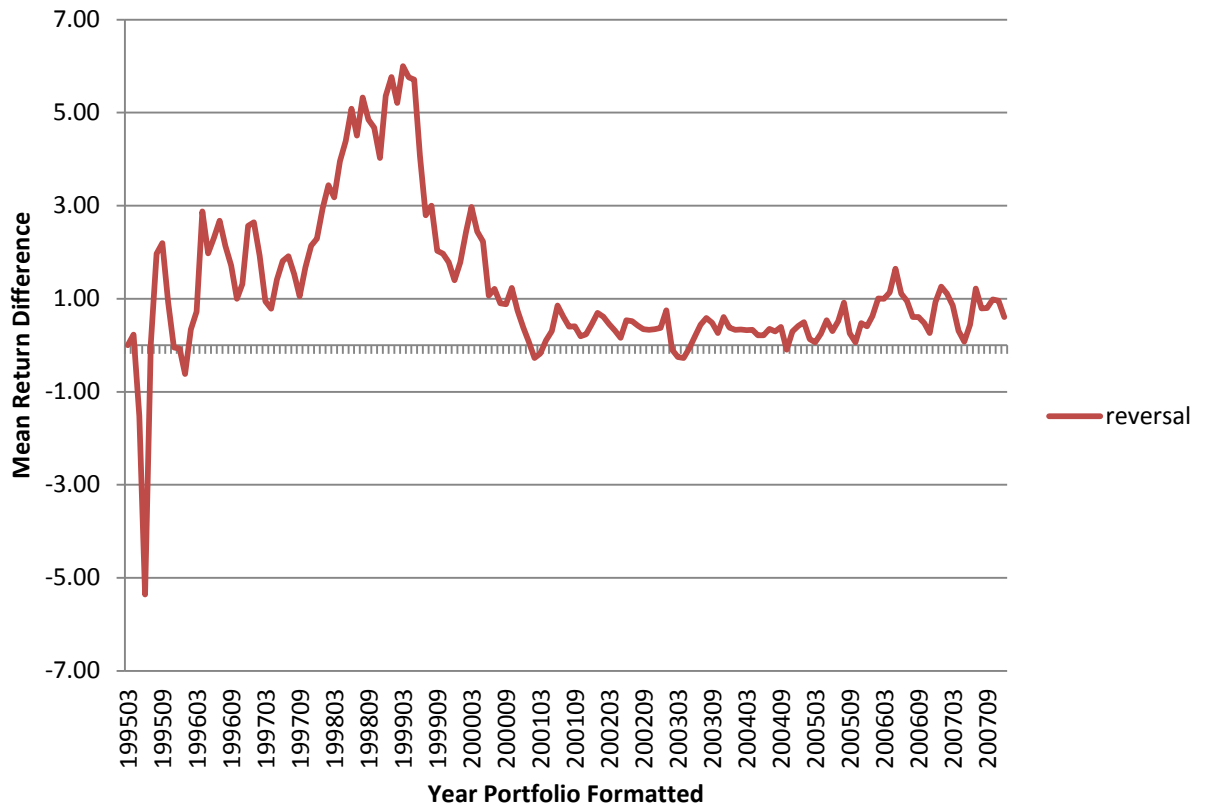
Graph 2: The Reversal Trend in China's Stock Market over the Long Term

It has been established from the above that the earlier period of the data used for the analysis had a higher effect on the reversal and the least effect was shown in the second group. Similar trends were shown with the separation of the whole China stock market into its respective exchanges; SSE (Tables 9 to 11) and SSE (Tables 12 to 14) according to those three periods. It was notable, however, in the first time group (Table 9), the SSE loser stocks showed very significant monthly mean returns of 4.32%, 3.025% higher than the winners' monthly mean returns. This reversal difference was 1.199% per month higher than of the SZSE's loser-winner difference. This proved the earlier conclusion that SSE, on average, was still the biggest contributor to the loser's reversal in the complete stock market in China. Consistent evidence

was shown by the SSE loser-winner difference still being higher for the next two time periods. SSE also showed almost double loser monthly mean returns for the first two time periods as compared to SZSE, which probably explained the higher reversal difference.

Similar earning trends were shown with the separation of the Type A and Type B stocks in the three time periods. The earlier period of data used for the analysis had a higher effect from reversal and the least effect was shown in the second group. These effects are shown in Tables 15 to 17 for the three time periods for Type A stocks and Tables 18 to 20 for the three time periods for Type B stocks. The fact that Type A stocks gave higher differences in the winners and losers was the same at the first group time period difference (which was also the highest for the whole period), at 1.192% per month, (in Table 15) as compared to only 0.492% per month for Type B stock difference, as shown in Table 18. The lowest reversal difference was shown by Type B stocks in the second group, recorded at 0.074% (Table 19), that are 0.403% lower than for Type A stock (Table 16) in the same time period. However, it must be noted that when all results in the second time period showed a negative return, Type B stock showed a positive monthly mean return during that period of 0.396% (Table 19).

8.2.January Effect Bias Results

A study by George and Hwang (2007) suggested that the first analysis should include the month of January and then be followed by an analysis without the month of January. This was necessary because many markets showed that there was a phenomenon called the January effect. In January, there will be major deviations in earnings, be it huge loses or huge profits (Gunasekarage & Kot, 2007; Gutierrez Jr. & Prinsky, 2006). Contrarian strategies have generated significant abnormal returns in the month of January (Gunasekarage, 2007). There was evidence in the US data analysed that strong loser reversals came exclusively from January (Figelman, 2007) and outside of January there was no loser reversal effect (George & Hwang, 2007). In January, the reversal should be stronger, hence, when the results were modified to exclude that month, the reversal should not be as strong, especially for the losers' reversal (Figelman, 2007). This was because the losers had a higher tendency for reversal. This bias can be attributed to the second cause of reversal, as discussed in the literature review.

The data was analysed again without the month of January's returns. It was excluded from the overall data used from March 1995 to November 2010, cutting down n to 141. When the portfolio were formatted, the formation period and holding periods remained at 36 months but without the months of January being included in the calculation, making it 33 months instead. There was no portfolio formatted in the month of January, which explained the reduction in the number of months used calculate the mean of returns down to 141 from 153 months in the initial analysis. From Table 21, the analysis without January, it can be seen that the winners' monthly mean return was 1.029% as compared to 1.178% from the initial analysis that included January. The loser also earned slightly less without the month of January, by

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0.175%. Overall, when January was included in the analysis, the profitability of holding losers instead of winners was around 1.254% per month, which was 0.026% higher than when January month was excluded. Even though, when January was excluded the degree of reversal reduced from 93.15% of the months to only 82% of the months, the 0.026% difference was not significant. Hence, the China's stock market can be seen as not having a January effect bias in its reversal. Therefore, the theory of tax avoidance incentives could not satisfactorily explain China's stock market long term reversal. However, it was proven that the losers did tend to reverse more in January compared to the winners as they had 0.175% monthly mean returns short without the month of January included in the analysis as compared to only 0.149% per month short for the winners. This agreed with the evidence from the US data analysed that strong loser reversals came more from January.

9. Discussion

1. Yuliang & Youwei (2010) undertook a study to explain the long term reversal effect. Their three competing explanations were past performance, value-growth characteristics and tax-motivated incentives, as discussed in the literature review. It can be understood now that the reversal was not attributed solely to an overreaction to past performance. However, the analysis of the effect of January bias has shown that even without the month of January included in the analysis, the reversal was still significant. This meant that the incentive to avoid tax by the winners did not explain all the reversal effect in China's stock market. China seemed to have an overreaction effect on its side. This was combined with the value-growth

characteristic in buying a stock. An investor can pick between the stock that was true to its value or was growing. In reference to Table 22, the low book-to-market value stocks that signified lower financial distress costs had a lower monthly mean returns than the high book-to-market value stocks, as shown in Table 23. In general, both winners and losers with high book-to-market values have higher mean returns. The winner and loser stocks that supposedly have higher financial distress costs (high book-to-market) had monthly mean returns of 1.383% and 1.921%, respectively. This was both higher than the monthly mean return for stocks that have lower financial distress costs (low book-to-market) with the winner only having a 0.647% monthly mean return and the loser having a monthly mean return of only 1.705%. Although, the reversal was higher with low book-to-market stocks recorded at 1.058% as compared to the 0.538% reversal with high book-to-market stocks. Losers for high book-to-market had the highest mean return of 1.921% per month proving that the value (loser) stock for the high book-to-market stocks had a chance of getting the larger return. The growth stock had the lowest earnings even when the stocks had a low book-to market ratio at only 0.647% of monthly mean returns, which was 0.274% lower than the loser with high book-to-market ratio. To some extent, it can be said that the value-growth characteristic was attributable to the reversal in China's stock market. The growth (winner) stocks having the lowest mean return signified the overvaluation of their worth. The value (loser) stocks were doing so much better than the rest even with the high book-to-market ratio value. However, this analysis has many limitations due to the insufficient availability of data to make a solid argument about whether the reversal was due to the growth value characteristic or not.

2. Calculating all these data and turning it into a prediction of a trend signalling future expected returns can assist in gaining abnormal returns. However, bear in mind that there was a significant cost that came with rebalancing the portfolio every time it was needed (Figelman, 2007). It will be difficult to incorporate this into the expected return models. Therefore, this study was mainly based on predicting a potential long term reversal trend in China's stock market formulated from past data that hopefully and potentially could be repeated in the future. It was hard for investors to keep track of all the news and earnings to actually predict future returns given limited budgets to pay for the costs associated with gathering the information. For China, the duty tax was 0.1% and the brokerage fee was 0.3% for selling and buying. Therefore, when the contrarian strategy of buying losers and selling winners was undertaken for each portfolio, there were 0.8% transaction fees in total that needed to be paid. After the 36 month period, another 0.8% needed to be paid to realise the profit for holding the loser and buying back the winner at a lower price. This was then 1.6% per transaction altogether to maintain one portfolio. This figure, divided into 36 months, will have an average of 0.0004444% effect on the mean return. This, however, should not have a significant effect on the return. However, just imagine if for every portfolio, which was constructed every month, was updated every month for the 36 month holding period by always buying the outermost loser and selling the outermost winner, the cost will be 0.8% times 18 (let's say it was updated every two months) = 14.4%. This figure divided by the 36 month period was 0.4% per month, which was quite ridiculous as the cost to rebalance the portfolio was almost half the monthly average return. Therefore, the idea to always buy the loser and sell the winner can only be done moderately to ensure the costs did not outweigh the benefits.

## 10.	Limitation

It has to be admitted that the data used for this study were comparatively smaller than any other study undertaken to prove this reversal. For example, the study by DeBondt and Thaler (1985) used data from 57 years; January 1926 to December 1982, while this study only used 18 years and 9 months of data. This was due to the limited data availability from China's stock market. This exposed this study to a high potential for statistical bias for not having enough samples to further strengthen the results. Perhaps, this study can be repeated in over more than twenty years to prove that the contrarian strategy was still usable in China's stock market.

## 11.	Conclusion

There was a long term reversal effect in China's stock market using earnings data from March 1992 to November 2010. This long term reversal was a violation of the EMH, which stated there was no way the future market can be predicted based on information from past performance, along with public and private information. There were some human behaviour issues that induced the possibility of this violation. Such issues discussed were the hot (cold) hand theory and the gambler's fallacy. This, along with information dissemination and assimilation lagging seen in human nature that causes news not to impact straight away on the value of the stocks, helped explain the possibility of this reversal. After investors adjust to the news, they tended to overreact and these reactions were usually at a time when the effect of the news had already achieved its peak and it was considered too late, hence, causing the

reversal to occur. These reversal effects were very much attributable to the overreaction effect although the value-growth characteristic using the book-to-market value to a limited extent also supported the cause of the reversal in China's stock market. The loser with a high book-to-market ratio had the highest monthly mean return while the winner with the low book-to-market ratio had the lowest. This proved that stocks with high book-to-market ratios have higher reversals than stocks with low book-to-market ratios and value stocks have higher mean returns than growth stocks as growth stocks tended to be more overvalued.

The long term reversal was proven significant in the study of China's stock market with the mean returns for the losers being 1.254% per month higher than the mean returns for the winners. This was especially evident in the SSE where there was a 0.361% per month higher reversal than for stocks from SZSE. Type A stocks, which were only available to the locals, have larger differences between the loser and winner stocks by 0.413% per month compared to Type B stocks, which were available to both locals and outsiders. This gave a slight advantage for the locals to make use of the contrarian strategy. With this evidence it can be advised that the contrarian strategy will definitely bring about abnormal profits to investors in China's stock market.

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13.   Appendices

Portfolios are formed every month between March 1995 and November 2007, hence, n= 153 months. Mean returns are the monthly average returns after the 36-month holding period in percentage terms.

Table 1: Reversal in China's Stock Market

Variable	N (months)	Mean Returns %	t Value	Pr > |t|
Winner	153	1.178	6.86	<.0001
Loser	153	2.432	12.01	<.0001
Loser - Winner	153	1.254	9.77	<.0001
Port. 2	153	2.129	12.15	<.0001
Port. 3	153	1.93	12.06	<.0001
Port. 4	153	1.934	11.93	<.0001
Port. 5	153	1.867	11.54	<.0001
Port. 6	153	1.718	11.12	<.0001
Port. 7	153	1.486	9.67	<.0001
Port. 8	153	1.494	9.6	<.0001
Port. 9	153	1.431	8.99	<.0001
>0	93.15%			

Portfolios for Tables 2 to 5 are formed for almost all months between March 1995 and November 2007, with some months excluded due to the unavailability of data.

Table 2: Reversal in SSE

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	149	1.134	6.52	<.0001
Loser	149	2.594	11.84	<.0001
Loser - Winner	149	1.46	8.62	<.0001
Port. 2	149	2.31	12.44	<.0001
Port. 3	149	2.042	12.09	<.0001
Port. 4	149	1.844	11.31	<.0001
Port. 5	149	1.716	10.58	<.0001
Port. 6	149	1.704	10.39	<.0001
Port. 7	149	1.596	10.02	<.0001
Port. 8	149	1.482	9.31	<.0001
Port. 9	149	1.456	8.63	<.0001
>0	81.88%			

Table 3: Reversal in SZSE

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	151	0.976	5.63	<.0001
Loser	151	2.075	10.03	<.0001
Loser - Winner	151	1.099	7.18	<.0001
Port. 2	151	1.765	9.69	<.0001
Port. 3	151	1.658	9.77	<.0001
Port. 4	151	1.65	10.22	<.0001
Port. 5	151	1.598	9.76	<.0001
Port. 6	151	1.785	10.46	<.0001
Port. 7	151	1.696	10.32	<.0001
Port. 8	151	1.53	9.28	<.0001
Port. 9	151	1.414	8.62	<.0001
>0	84.10%			

Table 4: Reversal in China's Type A stocks

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	151	1.309	6.89	<.0001
Loser	151	2.111	10.99	<.0001
Loser - Winner	151	0.802	15.29	<.0001
Port. 2	151	1.989	11.5	<.0001
Port. 3	151	1.975	11.42	<.0001
Port. 4	151	2.01	11.6	<.0001
Port. 5	151	1.841	11.15	<.0001
Port. 6	151	1.844	10.84	<.0001
Port. 7	151	1.713	10.58	<.0001
Port. 8	151	1.65	9.87	<.0001
Port. 9	151	1.46	8.57	<.0001
>0	94.00%			

Table 5: Reversal in China's Type B stocks

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	149	1.368	8.12	<.0001
Loser	149	1.758	8.68	<.0001
Loser - Winner	149	0.389	2.88	0.0046
Port. 2	149	2.2	11.21	<.0001
Port. 3	149	2.095	10.77	<.0001
Port. 4	149	2.028	10.3	<.0001
Port. 5	149	1.844	8.68	<.0001
Port. 6	149	1.819	9.25	<.0001
Port. 7	149	1.565	8.23	<.0001
Port. 8	149	1.421	8.01	<.0001
Port. 9	149	1.298	7.9	<.0001
>0	66.40%			

Tables 6 to 8 show the reversal for China's stock market separated into three time periods. The months when the portfolios are formed are shown by the formation dates beginning every table, with some months excluded due to the unavailability of data.

Table 6: Reversal in China's whole stock market
(Formation dates: March 1995 - December 1999)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	58	1.522	8.74	<.0001
Loser	58	3.875	16.95	<.0001
Loser - Winner	58	2.353	8.71	<.0001
Port. 2	58	2.942	18.47	<.0001
Port. 3	58	2.418	25.28	<.0001
Port. 4	58	2.472	20.63	<.0001
Port. 5	58	2.448	17.34	<.0001
Port. 6	58	2.13	18.49	<.0001
Port. 7	58	1.692	13.36	<.0001
Port. 8	58	1.878	16.15	<.0001
Port. 9	58	1.765	15.5	<.0001
>0	91.4%			

Table 7: Reversal in the China's whole stock market a
(Formation dates: January 2000 - December 2004)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	60	-0.241	-0.85	0.3964
Loser	60	0.288	1.03	0.306
Loser - Winner	60	0.529	6.53	<.0001
Port. 2	60	0.369	1.38	0.174
Port. 3	60	0.41	1.56	0.1245
Port. 4	60	0.398	1.51	0.1365
Port. 5	60	0.349	1.33	0.1871
Port. 6	60	0.329	1.28	0.2044
Port. 7	60	0.228	0.89	0.3774
Port. 8	60	0.147	0.55	0.5839
Port. 9	60	0.116	0.41	0.6837
>0	88.33%			

Table 8: Reversal in China's whole stock market
(Formation dates: January 2005 – November 2007)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	35	3.038	14.21	<.0001
Loser	35	3.715	17.91	<.0001
Loser - Winner	35	0.676	10.17	<.0001
Port. 2	35	3.802	17.76	<.0001
Port. 3	35	3.728	17.43	<.0001
Port. 4	35	3.677	17.44	<.0001
Port. 5	35	3.505	17.42	<.0001
Port. 6	35	3.416	16.34	<.0001
Port. 7	35	3.298	16.04	<.0001
Port. 8	35	3.166	15.3	<.0001
Port. 9	35	3.131	14.92	<.0001
>0	100.00%			

Tables 9 to 11 show the reversal for China's stock market separated into three time periods for SSE. The months when the portfolios are formed are shown in the formation dates beginning every table, with some months excluded due to the unavailability of data.

Table 9: Reversal in SSE
(Formation dates: March 1995 - December 1999)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	54	1.295	9.18	<.0001
Loser	54	4.32	14.56	<.0001
Loser - Winner	54	3.025	8.63	<.0001
Port. 2	54	3.407	16.72	<.0001
Port. 3	54	2.685	20.02	<.0001
Port. 4	54	2.171	20.22	<.0001
Port. 5	54	2.02	12.61	<.0001
Port. 6	54	2.061	11.82	<.0001
Port. 7	54	2.02	17.42	<.0001
Port. 8	54	1.964	21.52	<.0001
Port. 9	54	2.059	14.51	<.0001
>0	88.88%			

Table 10: Reversal in SSE
(Formation dates: January 2000 - December 2004)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	60	-0.177	-0.61	0.5449
Loser	60	0.419	1.51	0.1376
Loser - Winner	60	0.596	4.58	<.0001
Port. 2	60	0.468	1.76	0.0828
Port. 3	60	0.473	1.77	0.0821
Port. 4	60	0.451	1.69	0.0958
Port. 5	60	0.408	1.56	0.125
Port. 6	60	0.378	1.46	0.1487
Port. 7	60	0.233	0.88	0.3808
Port. 8	60	0.071	0.27	0.7917
Port. 9	60	-0.004	-0.01	0.9888
>0	78.33%			

Table 11: Reversal in SSE
(Formation dates: January 2005 – November 2007)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	35	3.132	13.28	<.0001
Loser	35	3.659	18.33	<.0001
Loser - Winner	35	0.526	4.99	<.0001
Port. 2	35	3.777	18.7	<.0001
Port. 3	35	3.742	17.68	<.0001
Port. 4	35	3.731	17.22	<.0001
Port. 5	35	3.488	17.77	<.0001
Port. 6	35	3.429	16.15	<.0001
Port. 7	35	3.281	15.23	<.0001
Port. 8	35	3.156	15.2	<.0001
Port. 9	35	3.03	13.98	<.0001
>0	77.14%			

Tables 12 to 14 show the reversal for China's stock market separated into three time periods for SZSE. The months when the portfolios are formed are shown in the formation dates beginning every table, with some months excluded due to the unavailability of data.

Table 12: Reversal in SZSE
(Formation dates: March 1995 - December 1999)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	56	1.101	5.25	<.0001
Loser	56	2.927	10.1	<.0001
Loser - Winner	56	1.826	4.79	<.0001
Port. 2	56	2.103	10.21	<.0001
Port. 3	56	1.873	10.1	<.0001
Port. 4	56	1.798	12.29	<.0001
Port. 5	56	1.809	10.98	<.0001
Port. 6	56	2.409	13.04	<.0001
Port. 7	56	2.3	15.19	<.0001
Port. 8	56	1.947	10.58	<.0001
Port. 9	56	1.512	9.89	<.0001
>0	76.78%			

Table 13: Reversal in SZSE
(Formation dates: January 2000 - December 2004)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	60	-0.273	-0.99	0.328
Loser	60	0.248	0.86	0.3937
Loser - Winner	60	0.521	6.38	<.0001
Port. 2	60	0.251	0.92	0.362
Port. 3	60	0.282	1.1	0.2745
Port. 4	60	0.373	1.43	0.1572
Port. 5	60	0.297	1.13	0.2618
Port. 6	60	0.235	0.9	0.3692
Port. 7	60	0.184	0.7	0.484
Port. 8	60	0.183	0.68	0.4963
Port. 9	60	0.23	0.81	0.4204
>0	83.33%			

Table 14: Reversal in SZSE
(Formation dates: January 2005 – November 2007)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	35	2.918	14.59	<.0001
Loser	35	3.844	16.61	<.0001
Loser - Winner	35	0.926	10.37	<.0001
Port. 2	35	3.818	16.48	<.0001
Port. 3	35	3.674	16.89	<.0001
Port. 4	35	3.603	17.34	<.0001
Port. 5	35	3.491	16.78	<.0001
Port. 6	35	3.444	16.23	<.0001
Port. 7	35	3.32	16.21	<.0001
Port. 8	35	3.171	16.23	<.0001
Port. 9	35	3.285	16.77	<.0001
>0		97.14%		

Tables 15 to 17 show the reversal for China's stock market separated into three time periods for Type A stocks. The months when the portfolios are formed are shown in the formation dates beginning every table, with some months excluded due to the unavailability of data.

Table 15: Reversal in China's Type A stocks
(Formation dates: March 1995 - December 1999)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	56	1.887	8.35	<.0001
Loser	56	3.079	15.34	<.0001
Loser - Winner	56	1.192	12.04	<.0001
Port. 2	56	2.61	21.77	<.0001
Port. 3	56	2.641	19.6	<.0001
Port. 4	56	2.728	18.59	<.0001
Port. 5	56	2.439	19.85	<.0001
Port. 6	56	2.512	17.68	<.0001
Port. 7	56	2.262	16.04	<.0001
Port. 8	56	2.274	16.55	<.0001
Port. 9	56	1.868	13.76	<.0001
>0		91.07%		

Table 16: Reversal in China's Type A stocks
(Formation dates: January 2000 - December 2004)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	60	-0.31	-1.06	0.2925
Loser	60	0.167	0.6	0.5503
Loser - Winner	60	0.477	9.54	<.0001
Port. 2	60	0.297	1.1	0.2758
Port. 3	60	0.285	1.07	0.2883
Port. 4	60	0.331	1.23	0.2235
Port. 5	60	0.276	1.04	0.3037
Port. 6	60	0.23	0.85	0.3972
Port. 7	60	0.233	0.9	0.3714
Port. 8	60	0.113	0.41	0.6806
Port. 9	60	0.053	0.18	0.8576
>0		98.33%		

Table 17: Reversal in China's Type A stocks
(Formation dates: January 2005 – November 2007)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	35	3.161	13.89	<.0001
Loser	35	3.895	19.51	<.0001
Loser - Winner	35	0.734	8.83	<.0001
Port. 2	35	3.894	18.21	<.0001
Port. 3	35	3.807	17.4	<.0001
Port. 4	35	3.738	17.54	<.0001
Port. 5	35	3.567	17.52	<.0001
Port. 6	35	3.542	16.71	<.0001
Port. 7	35	3.369	16.24	<.0001
Port. 8	35	3.288	15.52	<.0001
Port. 9	35	3.219	15.02	<.0001
>0		91.42%		

Tables 18 to 20 show the reversal for China's stock market separated into three time periods for Type B stocks. The months when the portfolios are formed are shown in the formation dates beginning every table, with some months excluded due to the unavailability of data.

Table 18: Reversals in China's Type B stocks
(Formation dates: March 1995 – December 1999)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	54	1.873	8.82	<.0001
Loser	54	2.365	6.59	<.0001
Loser - Winner	54	0.492	1.67	0.1008
Port. 2	54	3.296	8.87	<.0001
Port. 3	54	3.089	7.93	<.0001
Port. 4	54	2.812	6.88	<.0001
Port. 5	54	2.782	6.2	<.0001
Port. 6	54	2.449	5.88	<.0001
Port. 7	54	2.118	5.39	<.0001
Port. 8	54	2.044	6.64	<.0001
Port. 9	54	1.84	7.35	<.0001
>0	60.25%			

Table 19: Reversals in China's Type B stocks
(Formation dates: January 2000 - December 2004)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	60	0.396	1.24	0.221
Loser	60	0.471	1.82	0.0738
Loser – Winner	60	0.074	0.43	0.666
Port. 2	60	0.836	3.55	0.0008
Port. 3	60	0.839	3.65	0.0006
Port. 4	60	0.876	3.75	0.0004
Port. 5	60	0.584	2.37	0.0209
Port. 6	60	0.803	3.29	0.0017
Port. 7	60	0.66	2.57	0.0127
Port. 8	60	0.495	1.73	0.0884
Port. 9	60	0.546	1.81	0.0758
>0	63.33%			

Table 20: Reversals in China's Type B stocks
(Formation dates: January 2005 – November 2007)

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	35	2.256	13.14	<.0001
Loser	35	3.026	9.4	<.0001
Loser – Winner	35	0.77	4.3	0.0001
Port. 2	35	2.847	12.06	<.0001
Port. 3	35	2.715	12.92	<.0001
Port. 4	35	2.793	13.62	<.0001
Port. 5	35	2.557	13.35	<.0001
Port. 6	35	2.589	13.96	<.0001
Port. 7	35	2.262	12.46	<.0001
Port. 8	35	2.046	10.35	<.0001
Port. 9	35	1.751	10.04	<.0001
>0	68.57%			

Table 21 shows the analysis without January. With formation dates between March 1995 and November 2007, excluding the month of January. The formation and holding period become 33 months, instead of 36 months due to the exclusion of January.

Table 21: Reversal in the whole of China's stock market

Variable	N (months)	Mean Returns	t Value	Pr > |t|
Winner	141	1.029	5.52	<.0001
Loser	141	2.257	10.15	<.0001
Loser - Winner	141	1.228	7.93	<.0001
Port. 2	141	2.006	10.44	<.0001
Port. 3	141	1.71	10.21	<.0001
Port. 4	141	1.654	9.89	<.0001
Port. 5	141	1.668	9.94	<.0001
Port. 6	141	1.558	9.65	<.0001
Port. 7	141	1.367	8.65	<.0001
Port. 8	141	1.393	8.51	<.0001
Port. 9	141	1.166	7.3	<.0001
>0	85.82%			

In Tables 21 and 22, stocks are separated by low and high book-to-market value. The months when the portfolios are formed are shown in the formation dates beginning every table, with some months excluded due to the unavailability of data

Table 22: Low book-to-market stocks
Formation dates: March 1995 – November 2007

Variable	N (months)	Mean returns	t Value	Pr > |t|
Winners	133	0.647	3.13	0.0022
Losers	133	1.705	8.61	<.0001
Losers-Winners	133	1.058	13.95	<.0001
Port. 2	133	1.591	7.97	<.0001
Port. 3	133	1.531	7.94	<.0001
Port. 4	133	1.501	8.06	<.0001
Port. 5	133	1.409	7.79	<.0001
Port. 6	133	1.126	6.19	<.0001
Port. 7	133	0.95	5.29	<.0001
Port. 8	133	1.01	5.42	<.0001
Port. 9	133	0.956	4.83	<.0001
>0		92.48%		

Table 23: High book-to-market stocks
Formation dates: March 1995 – November 2007

Variable	N (months)	Mean returns	t Value	Pr > |t|
Winners	144	1.383	10.1	<.0001
Losers	144	1.921	9.78	<.0001
Losers-Winners	144	0.538	4.71	<.0001
Port. 2	144	1.904	10.61	<.0001
Port. 3	144	1.84	10.98	<.0001
Port. 4	144	1.837	11.03	<.0001
Port. 5	144	1.817	11.08	<.0001
Port. 6	144	1.686	10.43	<.0001
Port. 7	144	1.736	11.38	<.0001
Port. 8	144	1.624	10.74	<.0001
Port. 9	144	1.664	11.63	<.0001
>0		66.66%		