| RESEARCH ARTICLE

Understanding Momentum and Reversal Investing Strategies

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| ABSTRACT

Momentum and reversals are two phenomena to explain the past return trend. Originally introduced by Jegadeesh and Titman in 1993, momentum is now a common investment strategy when investors are trading securities. It points out the stock price may have a relationship with their past performance. A large number of researchers have been trying to find out the momentum investment effect based on empirical evidence in different markets in different investment periods, which include short term, medium term and long term. Moreover, a series of research concludes that the momentum investment strategy tends to help investors to get a higher return. In recent years, a large number of researchers have focused more on analysing financial markets in China, and they have paid more attention to improving the traditional Jegadeesh and Titman models. In addition, an increasing number of researchers also point out that noise trading is quite important in the security investment strategy, and the investors who are using a momentum investment strategy to trade their portfolios are supposed to take the noise trading strategy into consideration. Then a series of papers have been tried to explain the sources of the momentum effect, either risk-based or behavioural-based. When it assumes that the market is efficient, the past market prices could be reflected, and it is hard to get excess returns by observing the stock's past prices performance. Nevertheless, the momentum effect is likely to examine that the market is inefficient. When it tries to explain the momentum effect in risk-based sources, the abnormal price return may be derived from a risk that is undiversifiable. As for the behaviour-based explanation, several behavioural biases applied by different researchers could be used to study the momentum effect, such as cognitive errors, including the conservatism bias, the representative bias, and the emotional bias, including the loss aversion bias, the overconfidence bias and the self-attribution bias. Another possible explanation within this behavioural source is that overreaction to the news leads to the existence of price momentum.

| KEYWORDS

Momentum, reversal, market efficiency

| ARTICLE INFORMATION

1. Introduction

Momentum and reversals are two phenomena to explain past return trends. Momentum was first introduced by Jegadeesh and Titman in 1993 and is now discussed as a common investment strategy when investors are trading securities. It points out the stock price may have a relationship with their past performance. It could also be simply understood as an investment strategy that investors should buy winner portfolios and sell loser portfolios based on their past return performance. A series of papers have tried to explain momentum, either risk-based or behavioural-based; however, none are widely accepted. In addition, momentum is often deeply discussed in market efficiency as a reliable anomaly of usual empirical asset pricing models, for example, Carhart's (1984) four-factor model and five-factor model raised by Fama and French in the year 2015. And a risk exposure to explain return premium concerning recent price performance has not yet been recognised.

This essay is going to examine the momentum investment effect and reversal investment effect. The following part is going to summarise the empirical evidence, then analyse the sources of the momentum trading effect that divides the base into risk and behaviour, and then the reversal phenomenon. In the last part, this essay will analyse the gaps among different research to the empirical analysis of momentum and reversal.

2. Empirical Evidence

The empirical research by Jegadeesh and Titman in 1993 is likely to be regarded as the most typical example of studying the momentum trading effect, and they are trying to study the data from the Center for Research in Security Prices and return in the period of 3 to 12 months. To analyse the study result in the short investment term, this research concludes that the investors that use the strategy of buying the winning portfolios and selling the loser portfolios tend to generate excess returns. Nevertheless, the mentioned abnormal return would be less, and the loser portfolios would generate higher returns compared with the winners. This research tries to give the explanation of this result that the price of the stock deviates from its true value in the long investment period because the investors are applying the momentum trading strategies and then cause the stock price overreaction.

Afterwards, subsequent studies to refine and extend the original momentum studies regarding Jegadeesh and Titman provide ample empirical evidence with discussion. Similarly, Rouwenhorst (1998) finds return continuation in the medium term, which is winner portfolios continue outperforming loser ones based on this study towards internationally diversified portfolios in twelve European countries. The continuation holds for firms of any size and has a negative correlation with risk factors such as firm size but is not limited to small firms. Both his study in European evidence and the finding in the U.S. market from Jegadeesh and Titman (1993) have a similar conclusion, proving that momentum is unlikely due to chance. Furthermore, Berger, Israel and Moskovitz (2009) study individual U.S. stocks, global asset classes and markets and note that momentum is a trend in that stocks continue their persistence in relative performance in a certain period.

Following Jegadeesh and Titman's research in 1993, Conrad and Kaul (1998) tried to analyse the profit sources of return-based trading investment strategies. They collect and analyse data available from NYSE/AMEX in the period of 1926 to 1989, holding periods between one week and thirty-six months, and fifty-five out of one hundred and twenty investment strategies. Conrad and Kaul divide the investment term into three kinds, which were short-term (one week to three months), medium-term (three to twelve months) and long-term (thirteen to thirty- six months). They state that gains derived from momentum investment could be explained by the differences in expected returns of the stocks. However, they cannot reject the hypothesis that profits of momentum could be explained by cross-sectional variation mean returns. Conrad and Kaul conclude that both momentum and reversal strategies tend to be successful strategies; nevertheless, a momentum investment strategy is likely to generate profits in a medium investment term. Nevertheless, the reversal strategy could get significant positive profits in a long investment term but solely between 1926 and 1947 period. They also find that cross-sectional differences in the mean return are quite important to analyse the profitability of individual stocks in these investment strategies. However, Jegadeesh and Titman (2002) disagree and argue that unconditional expectations are not enough to explain the momentum gains and also the reversal strategy. But they state that the conditional expectations could explain the momentum gains and the reversal strategy.

By dividing the returns into two factors of systematic risk and stock-specific residuals, Grundy and Martin (2001) state that momentum is derived totally by the momentum performance in residual returns, which is encouraged by observable factor model misspecification. Grundy and Martin also conclude that momentum performs as a feature of unusual returns. However, by considering conditional beta dynamics and latent factors, Kelly, Moskowitz and Pruitt (2021) have a different conclusion and state that residual momentum is less significant.

Chordia and Shivakumar (2002) divide security returns into two elements which are predictable using macroeconomic factors and also unpredictable components. They state that conditional expected returns forecasted by macroeconomic factors are likely to explain better momentum returns compared with using residual returns. Chordia and Shivakumar (2002) also disagree with the conclusion of Grundy and Martin (2001) of the forecastable element of dynamic factor risk premium; however, they do not try to give an empirical test to explain in the research.

A series of research concludes that the momentum investment strategy tends to help investors to gain a higher return. Asness, Frazzini, Israel and Moskowitz (2014) collected and analysed the stock data in the US in the period between 1927 and 2013, and they point out that the investors who use a momentum investment strategy are likely to get an average of 8.3% annualised investment return after deducting the trading fees, which is higher than that of 7.9% of the S&P 500 Index. In addition, the value investment strategy could only gain a 4.7% annualised investment return in the same trading term, which is only half of that of the momentum investment strategy. Foulke, Vogel and Gray (2015) try to collect and examine the data in the US market in the period of 1963 to 2014, and they conclude that investors who are using a momentum investment strategy could achieve an annualised return of 18.8% and it achieves the better performance of 10.2% of that of S&P 500 Index at the same investment term.

By studying the KPS stock month return observations with thirty-six characteristics in the period from 1966 to 2014, Kelly, Moskowitz and Pruitt (2021) are trying to evaluate the momentum and reversal investment strategy, aiming to analyse to what extent the momentum premium could be explained by the conditional risk exposure. In this research, the common momentum investment strategy, which is the top quintile less bottom quintile of the securities and ranked according to the past t-2 to t-12 month returns, performs a significant return. They also adjust the conditional model by cutting out other priced factors, and then positive returns are derived from the residual momentum investment strategy, which ranks returns based on their residual part. However, they note that ranking stocks according to the forecastable part in the conditional model could generate larger profits of three to four times. They also conclude that the conditional model they used could explain a large part of the unconditional momentum investment effect. Nevertheless, the momentum effect performs differently when they use different factors; for instance, it has significant annualised alpha when it applies the factors of the static Fama and French (2015) model but insignificant and negative when it uses factors of the dynamic model in the empirical research applied in Kelly, Moskowitz and Pruitt (2021).

In recent years, a large number of researchers have paid more attention to improving the traditional Jegadeesh and Titman model and applying it to analyse financial markets in China. Ma, Chen and Yu (2016) collect data from Shanghai Shenzhen 300 Index to analyse the application of the momentum investment strategy in the market in China. It is considered that the risk of the investment composite is not included when it uses the cumulative yield of the stocks to measure the performance of the investment composite. Ma, Chen and Yu (2016) raise that the Sharpe ratio is likely to be a better criterion to measure the winner and the loser in the momentum investment strategy. Based on SVM-Sharpe analysis, their research finds that it is likely to have positive performance in the momentum investment strategy in the investment term of one year or less. Chen (2018) collects and analyses data in the A share market in China, and Chen ranks the winner and the loser composite portfolio in the momentum investment strategy according to the return interval. It is found in Chen (2018) states that ranking the winner and the loser composite portfolio in the momentum investment strategy according to the return interval could generate a more accurate result, and moreover, it could make relatively significant momentum profit in daily trading. In addition, a series of research also take investors' sentiments into consideration when they are studying the momentum and reversal investment strategy. Shi and Wang (2015) analysed the Shanghai A share market, and Zhou and You (2018) studied the stock industry sector; they both divided the sample according to the sentiment of the investor and then analysed the momentum investment return in different investor sentiments. They both conclude that the momentum investment effect in the investment market in China should attribute to the optimistic sentiment of the investors, and the empirical evidence also shows that the momentum investment effect is more likely to appear in the period the investors perform optimistic sentiment.

Moreover, an increasing number of researchers also note that noise trading plays an important role in the security investment strategy, and the noise trading strategy should also be considered when investors are using a momentum investment strategy to trade their portfolios. Wu and Liang (2010) studied the excess return of the security market in Taiwan, and they found that the trading of the investors who applied a noise trading strategy is likely to have an effect on the liquidity of the market and the price of the stocks, and therefore, aiming to achieve excess return should take consideration of the noise trading investors performance. Shi, Thomas and Liang (2012) use the behavioural activity function of rational investors and feedback trading investors, and they find that the stock trading activity has a relatively larger impact on the stocks with higher information uncertainty. In addition, stocks with positive feedback trading activity would be more likely to generate higher momentum profit in the momentum investment strategy activity. Constructing virtual assets pricing model based on the noise trading model, Lu and Chen (2012) point out that the volatility of the virtual asset price would be higher when the investors are using both the noise trading strategy and momentum trading strategy at the same time. Li, Jiang and Yang (2019) study the characteristic of rational investors and rank the winner portfolios and the loser portfolios according to the heterogeneous belief of the investors, overconfidence of the investors and disposition effect of the investors who are loss aversion in the concept of behavioural finance. The empirical evidence of Li, Jiang and Yang (2019) research shows that the disposition effect of loss aversion investors is likely to accelerate the reversal of the stock price movement; however, the portfolios with firm heterogeneous beliefs and the portfolios with high overconfidence are more likely to generate higher momentum profit comparing with the portfolios that applied the common Jegadeesh and Titman momentum investment strategy.

3. Underlying Sources of Momentum

When it is assumed that the market is efficient, the past market prices could be reflected, and it is hard to get excess returns by observing the stock's past prices performance. Nevertheless, the momentum effect is likely to examine that the market is inefficient. When it tries to explain the momentum effect in a risk-based source, the abnormal price return may be derived from a risk that is undiversifiable. As for the behaviour-based explanation, several behavioural biases applied by different researchers could be used to study the momentum effect, such as cognitive errors, including the conservatism bias, the representative bias, and the emotional bias, including the loss aversion bias, the overconfidence bias and the self-attribution bias. Another possible explanation within this behavioural source is that overreaction to the news leads to the existence of price momentum.

3.1 Source Based on Risk Rewards

When it tries to analyse the source of momentum trading strategies in the base of risk, the securities price momentum trading strategy could be used when analysing the undiversifiable risk in the research of Berger, Israel and Moskovitz in 2009. The research of Chordia and Shivakumar in 2002 tries to connect the momentum trading effect momentum to the risk factors in the firm business cycle. In addition, in the research of Berk, Green and Naik in 1999, it is stated that the cross-sectional risk could produce an excess return. Nevertheless, Conrad and Kaul (1998) state that different degrees of risk in different firms could attribute excess return. In addition, Johnson (2002) constructs a model to analyse the source of momentum strategy profit, and it concludes that it is generated from a random growth rate. In the research by Liu and Zhang in 2008, they analysed momentum strategies based on the research of Johnson, and they took a risk from growth rate and risk premium into consideration when they analysed the source of the momentum trading effect.

3.2 Source Based on Behaviour of the Investors

A series of research has tried to analyse the source of the momentum effect in behavioural finance, for example, the conservatism bias and the representative bias mentioned in the BSV model of Barberies, Shleifer and Vishny (1998), the overconfidence bias and the biased self-attribution in the DHS model of Daniel, Hirshleifer and Subrahmanyam (1998), the news watchers and the momentum traders in the DHS model of Hong and Stein (1999).

Among the mentioned research, investors who perform conservatism bias are more likely to maintain their previous thoughts by inadequately considering new information, and these investors tend to weigh old information more than new information when they are trading, and this kind of cognitive error could be reduced or be corrected by properly weighting and analysing new information in the market. The investors who perform representative bias tend to judge new information based on their prior experiences and classifications, and this bias shows because the investors are more likely to classify thoughts and objects into their personalised categories based on their past investment experiences. And investors could try to avoid representative bias and choose appropriate investment portfolios by asking themselves some questions when they are trading, for example, how do the portfolios under consideration perform compared to similar sized and similarly styled portfolios, or what is the tenure of the advisers and managers in the investment portfolios and funds, or are the managers highly regarded or well-known, whether the fund has consistently pursued its investment strategy, or has the style of the investment portfolio drifted during different periods with different market conditions. Investors who perform overconfidence bias are likely to show unwarranted faith in their investment reasoning, judgment and cognitive abilities, which may be the result of overestimating their knowledge levels, abilities and their access to market information. And the overconfidence bias could be divided into two ways, which are an illusion of knowledge bias, including prediction overconfidence bias and certainty overconfidence, and the self-attribution bias, including the self-enhancing bias and the self-protecting bias. Investors who perform self-enhancing bias are likely to take all of the credit for their success; however, they place the blame for the unsuccess on someone else when evaluating their trading strategy. As the overconfidence bias and the self-enhancing bias are emotional biases in the concept of behavioural bias, they are more difficult to moderate but should be adapted to. However, the investor could also review the trading records of their trading activities to identify the winner portfolios and the loser portfolios. Reviewing the trading records of their trading activities could also help the investors to avoid too much trading. And investors should be advised to track each of their investment tradings and then try to calculate their total return, and in this way, the investors who perform the overconfidence bias and the self-enhancing bias could be easier to understand the bias in their ways.

The BSV model of Barberies, Shleifer and Vishny (1998), the DHS model of Daniel, Hirshleifer and Subrahmanyam (1998), and the DHS model of Hong and Stein (1999) conclude that investor sentiments such as loss aversion, overconfidence and under reaction are likely to have a significant impact on momentum trading effect. Delong, Shleifer, Summers and Waldmann (1990) focus on positive feedback investment strategies and try to explain the momentum strategy effect by analysing the investors' trading behaviours. Later, Li and Yang (2013) tried to construct the perfect equilibrium based on the prospect theory in their research to examine the disposition effect. In their study, they draw a conclusion that the disposition effect causes the momentum trading effect based on the cross-sectional data. To summarise, a series of research explains the sources of the momentum trading effect independently.

This part tries to analyse the behavioural source of the momentum trading strategy effect in three ways. The cognitive bias of behavioural bias of the investors in the market will be taken into consideration. Firstly, the excess return of the momentum trading strategy effect could be related to the underreaction of the investors.

As a matter of fact, there would be many ways for investors in the market to get market information on the securities, and different methods may take them different time to respond to the change in the market and to get the new information. And then, a different time lag of the investment strategies may cause the investors to take a different level of investment adjustment and then would have a different level of impact on the stock price.

In the research of Van Dijk and Huibers in 2010, they show that investors in the European market are likely to hold an optimistic attitude when the stock price is facing a trend of reduction. In addition, the study of Chan et al. (1996,1999) and Klein (1990) agree that American investors are also likely to hold an optimistic attitude when the stock price is facing a trend of reduction. The research of Hong et al. in 2003 tries to analyse the momentum trading effect in the international markets. Nevertheless, they draw an opposite conclusion that underreaction is quite important to analyse the momentum trading effect; however, it is not a sufficient condition to analyse the momentum trading effect.

The second explanation to analyse the momentum trading effect is that the investors would be overreacted to the market news. In the research of Jegadeesh and Titman in 2001, they concluded that the outperformance of the stock price is derived from the overreaction of positive market news. However, the security price is likely to drop when the market releases negative news about the stocks. Nevertheless, according to behavioural finance, investors who have an overconfidence bias are likely to buy more stocks, and then the price momentum of the stocks would follow. The overconfidence bias could be divided into two ways, which are an illusion of knowledge bias, including prediction overconfidence bias and certainty overconfidence, and the self-attribution bias, including the self enhancing bias and the self protecting bias. Investors who perform self enhancing bias are likely to take all of the credit for their success; however, they place the blame for the unsuccess on someone else when evaluating their trading strategy. As the overconfidence bias and the self enhancing bias are emotional biases in the concept of behavioural bias, they are more difficult to moderate but should be adapted to. However, the investor could also review the trading records of their trading activities to identify the winner portfolios and the loser portfolios. Reviewing the trading records of their trading activities could also help the investors to avoid too much trading. And investors should be advised to track each of their investment tradings and then try to calculate their total return, and in this way, the investors who perform the overconfidence bias and the self enhancing bias could be easier to understand the bias of their ways.

The third possible source to explain the momentum trading effect is the disposition effect. In the research of Henrik et al. in 2009, one hundred and forty-two samples are included. And they find that the investors are more likely to sell winner portfolios soon but are more likely to keep loser portfolios longer, which means they show a kind of emotional, behavioural bias of loss aversion. Investors who have loss aversion emotional bias are likely to avoid losses as opposed to achieving gains, which means they tend to weight loss more than gain. And therefore, they usually hold loser portfolios for a longer investment term and sell winner portfolios for a short investment term.

4. Conclusion

In conclusion, the empirical research by Jegadeesh and Titman in 1993 is likely to be regarded as the most typical example of studying the momentum trading effect, and they are trying to study the data from the Center for Research in Security Prices and return in the period of 3 to 12 months. A large number of researchers have been trying to find out the momentum investment effect based on empirical evidence in different markets in different investment periods, which include short term, medium term and long term. For instance, the research of Jegadeesh and Titman in 1993 is trying to collect and analyse data from the Center for Research in Security Prices; the research of Rouwenhorst in 1998 studies return continuation in medium term, the research of Berger, Israel and Moskovitz in 2009 study individual U.S. stocks, global asset classes and markets; the research of Conrad and Kaul 1998 studies the sources of gains of return-based trading investment strategies and they collect and analyse data available from NYSE/AMEX in the period of 1926 to 1989, and holding periods between one week and thirty-six months, and fifty-five out of one hundred and twenty investment strategies; the research of Grundy and Martin in 2001 trying to take systematic risk and stock-specific residuals into consideration, the research of Chordia and Shivakumar in 2002 divide security returns into two elements, which are predictable using macroeconomic factors and also unpredictable component; the research of Kelly, Moskowitz and Pruitt in 2021 by studying the KPS stock month return observations with thirty-six characteristics in the period from 1966 to 2014, this research is trying to revaluate the momentum and reversal investment strategy, aiming to analyse to what extent the momentum premium could be explained by the conditional risk exposure.

Moreover, a series of research concludes that the momentum investment strategy tends to help investors to get higher returns; for instance, the research by Asness, Frazzini, Israel and Moskowitz in 2014 collected and analysed the stock data in the US in the period between 1927 and 2013; the research of Foulke, Vogel and Gray in 2015 try to collect and examine the data in the US market in the period of 1963 to 2014.

In recent years, a large number of researchers have focused more on analysing financial markets in China, and they have paid more attention to improving the traditional Jegadeesh and Titman models. For example, the research of Ma, Chen and Yu in 2016 collected data from Shanghai Shenzhen 300 Index to analyse the application of the momentum investment strategy in the market in China. The research by Chen 2018 collects and analyses data in the A share market in China, and Chen ranks the winner and the loser composite portfolio in the momentum investment strategy based on the return interval. The research of Shi and Wang in 2015 analysed the Shanghai A share market, and the research of Zhou and You in 2018 studies the stock industry sector, and they

both divided the sample based on the sentiment of the investors, and then they analysed the momentum investment return in different investor sentiment.

In addition, an increasing number of researchers also point out that noise trading is quite important in the security investment strategy, and the investors who are using momentum investment strategy to trade their portfolios are supposed to take the noise trading strategy into consideration. The research of Wu and Liang in 2010 studies the excess return of the security market in Taiwan to find whether the trading of the investors who applied noise trading strategy is likely to have an effect on the liquidity of the market and the price of the stocks, and therefore, aiming to achieve excess return should take consideration of the noise trading investors performance. The research of Shi, Thomas and Liang in 2012 uses the behavioural activity function of rational investors and feedback trading investors. The research of Lu and Chen in 2012 constructs virtual assets pricing model based on the noise trading model, and it tries to examine whether the volatility of the virtual asset price would be higher when the investors are using both the noise trading strategy and momentum trading strategy at the same time. The research of Li, Jiang and Yang in 2019 tries to study the characteristic of rational investors and rank the winner portfolios and the loser portfolios according to the heterogeneous belief of the investors, overconfidence of the investors and disposition effect of the investors who are loss aversion in the concept of behavioural finance.

Then a series of papers have been tried to explain the sources of the momentum effect, either risk-based or behavioural-based, although none of them is widely accepted. When it assumes that the market is efficient, the past market prices could be reflected, and it is hard to get excess returns by observing the stock's past prices performance. Nevertheless, the momentum effect is likely to examine that the market is inefficient. When it tries to explain the momentum effect in a risk-based source, the abnormal price return may be derived from a risk that is undiversifiable. As for the behaviour-based explanation, several behavioural biases applied by different researchers could be used to study the momentum effect, such as cognitive errors, including the conservatism bias, the representative bias, and the emotional bias, including the loss aversion bias, the overconfidence bias and the self-attribution bias. Another possible explanation within this behavioural source is that overreaction to the news leads to the existence of price momentum. For a better understanding of the behaviour-based explanation as the source of the momentum investment effect, it is better to have a good command of several behavioural biases. For example, the cognitive errors which are easier to correct, such as the conservatism bias, the representative bias, and the emotional bias, are more difficult to moderate but should be adapted to, for instance, the loss aversion bias, the overconfidence bias and the self-attribution bias. Another possible explanation within this behavioural source is that the investors would overreact to the market news and then cause a momentum trading effect to show.

In addition, it tries to explain the momentum effect in risk-based sources; the abnormal price return may be derived from a risk that is undiversifiable. As for the behaviour-based explanation, several behavioural biases applied by different researchers could be used to study the momentum effect, such as cognitive errors, including the conservatism bias, the representative bias, and the emotional bias, including the loss aversion bias, the overconfidence bias and the self-attribution bias. Another possible explanation within this behavioural source is that overreaction to the news leads to the existence of price momentum.

Having a good understanding of several behavioural biases is beneficial to study the source of the momentum investment effect. For example, the cognitive errors which are easier to correct, such as the conservatism bias, the representative bias, and the emotional bias, are more difficult to moderate but should be adapted to, for instance, the loss aversion bias, the overconfidence bias and the self attribution bias. Another possible explanation within this behavioural source is that overreaction to the news leads to the existence of price momentum.

Conflicts of Interest: The authors declare no conflict of interest.
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