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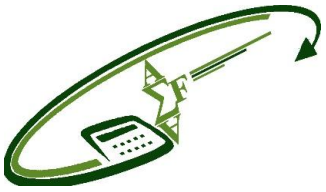

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Impact of Momentum on Stock Returns in Different Market Conditions

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ABSTRACT

The purpose of this study is to compare the impacts of momentum on stock returns of companies listed in Tehran Stock Exchange in different market conditions. For this purpose, the sample size is 120 months from 2008 to 2017. The research hypotheses are estimated using multivariate linear regression using time series method. Based on the results of the hypotheses test, the momentum in each of the market conditions, including normal, ascending and descending conditions, has a positive and direct effect on the stock returns of the companies listed in Tehran Stock Exchange, which indicates the principle of investors' insatiability in the stock exchange Tehran seeking to maximize its return on investment with a certain risk that in a downside mode of market, their insatiability exits less and faster than their momentum conditions, which is a reason for investors' loss evasion in this situation.

1 Introduction

The modern financial theory has been dominated academic circles and world's financial markets more than half a century. But in recent years, observing some empirical evidence in markets has challenged the theory. In recent years, financial scholars have been studying and conducting research about this empirical evidence. Studies in recent years have challenged many of the assumptions of modern financial theory, one of the most challenging observations in financial markets is that, unlike the efficient market hypothesis, which is the basis of many theories presented in modern financial theory, normal stock returns have a special behavior at different times and individual investors can achieve returns more than market returns without tolerating more risk and only by utilizing the strategy of appropriate investment [8]. In most of the world's exchanges, researchers have conducted extensive studies on the efficiency of various investment strategies and currently, one of the strategies that are widely used is the momentum strategy in the world's capital markets. For the first time in 1993 it was proven that the momentum strategy will generate roughly one percent monthly yield over the next 6 months [13]. This strategy is against the efficient market hypothesis, so confirmation of the usefulness of this strategy and considering the factors affecting the explanation of this strategy can create a major challenge against the modern financial theory and market efficiency [8].

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2 Literature Review

Investors in the stock market seek to earn more profit and reduce the risk of their investments. While, according to the efficient market hypothesis, returns are not possible more than the average return of market. A number of studies have shown evidence of abnormal return. One of the abnormal phenomena of the capital market, which cannot be justified on the basis of the capital market efficiency hypothesis, is the momentum factor [10]. After that, other researchers such as Conrad and Kaul [10] McKnight and Hou [12] have shown the usefulness of the momentum strategy in the US and Europe stock markets [13]. Momentum is a concept in physic science that states that a moving object tends to remain in motion unless a force from outside enters on it (Newton's first law). In other words, the example of this law in the market is that a price trend will remain as long as an external force prevents it. This strategy involves market-based investment and claims that the positive or negative returns of the past will continue to persist for a certain period of the future [8]. Therefore, the attractiveness of reviewing this strategy is that it directly counteracts the accepted doctrine of market efficiency. The efficient market hypothesis claims that there is no particular trend in the returns and prices of securities, and the behavior of prices is random and unpredictable. According to the efficient market hypothesis, the performance of portfolio is independent of its past performance. Therefore, confirmation of the usefulness of this strategy can be a major challenge to the modern financial theory and market efficiency [8]. Therefore, the main objective of the present research is to measure the impact of momentum on stock returns by analyzing real information and study its impact on stock returns of companies listed in Tehran Stock Exchange in different conditions of market, including normal, ascending and descending conditions. In fact, if the assumptions of the research are confirmed, investors in the Tehran Stock Exchange can not only maximize returns using the momentum strategy, but it can also be admitted that stock returns in different market conditions have a pattern and behavior that results in a sustained return to a certain period of the future, which is considered as an attractive research consideration in contrast to market efficiency.

Chen and Hwang [6] surveyed Business cycle, expected return and momentum payoffs. They applied the concept of time-varying risk premium at firm level and examined whether business cycles affect each firm differently. To this end, they used macroeconomic variables to predict expected returns at firm level and attempt to explain momentum payoffs. Their empirical results show past winners tend to have higher expected returns while past losers have lower expected returns predicted by macroeconomic variables. Also, discount rates of winners are likely to move downward while those of losers move upward contrarily. Therefore, they confirm cross-sectional differences in expected returns and their variation through time can contribute to momentum payoffs. Chou et al. [7] examined the relationship between asset growth, style investing and momentum. They established a significant and robust connection between asset growth (AG) and style investing by showing that past style returns constructed based on AG and size jointly predict future stock returns significantly. Motivated by this notion, they propose a style momentum strategy based on AG and size and find that it dominates price momentum and size-BM style momentum in generating momentum profits. Their research results show that the AG-size style momentum profit is induced because investors neglect the AG-size style performance, consistent with the limited-attention explanation, but not risk exposure to the investment factor. Further, they show that the profit of the AG-size style momentum is robust to different time periods partitioned by several time-series predictors.

Baltzer, et al. [3] Using unique data with the complete ownership structure of the German stock market, they studied the momentum and contrarian trading of different investor groups. Foreign investors and financial institutions, especially mutual funds, are momentum traders, whereas private investors are contrarians. The disposition effect only partly explains the aggregate contrarian trading of private investors. They documented a substantial increase in sales of past loser stocks by

momentum traders during the market decline associated with the recent financial crisis 2007–2009. Evidence indicates that these excessive sales pushed prices below their fundamental value and are predictive of the momentum crash in 2009. Jokar, et al. [9] have investigated the effect of investors' behavior and stock return management on companies listed to the Tehran Stock Exchange. For this purpose, a sample of 200 companies listed in Tehran Stock Exchange has been selected during the period from 2010 to 2016. Evidence from the experimental results of the research showed that the behavioral variables studied in the research has a significant and inverse effect on the stock return of the companies. Vinh Vo and Binh [16] have investigated the price momentum hypothesis in the Vietnam stock market to determine whether there is a price momentum in Vietnam stock market. For this purpose, they have selected an example of companies listed in Vietnam Stock Exchange in June 2007 to October 2015. The results of their research indicate that there are the impacts of momentum in Vietnam stock market. They also specified a strategy in which investors selected portfolios based on the past six months and kept their portfolio for nine months create a significant profit. Chang et al. [5] studied the effect of momentum in Japan. They demonstrate that the residual momentum strategy, which is constructed to hedge out the risk exposure to the Fama–French factors, is profitable in Japan for short-term holding periods ranging from three to 12 months. Residual momentum profits over long-term holding periods ranging from two to five years do not reverse, unlike traditional price momentum strategies observed in the U.S. market. The findings in both short- and long-term holding periods are attributed to investor under reaction. A comprehensive index of limited attention supports investor under reaction as an underlying cause of momentum in Japan [5]. Ahmadi and Kordloei [1] investigated the effect of financial stress on the investment behavior of companies listed to the Tehran Stock Exchange. According to the systematic elimination method, they selected 104 companies as a statistical sample between 2011 and 2016. Their research results show that firms with less investment opportunities tend to be less likely to invest, in addition distressed financially firms with more investment opportunities are more likely to increase investment.

Khani et al. [11] studied the expected rate of return on the basis of the Karhart model and the CAPM model. To this end, they have studied 126 companies listed to the Tehran Stock Exchange during the period from 2007 to 2016 as a statistical sample. The results of their research showed that there is a significant difference between the mean total returns and the return on capital gains and stock prices, while there is no significant difference between the average growth cash flow and stock value. In addition to growth reserves, the expected returns based on the Carhart model are closer to the actual returns than expected on the basis of the asset price model. But in the case of stock values, the expected returns based on the Carhart model will not be closer to actual returns compared to expected returns based on the asset price model of capital and cost of capital, and ultimately for growth stocks, expected returns based on Carhart's model Comparison with expected returns, the implicit capital model is close to real returns. Min and Kim [14] examined whether time changes in the momentum strategy's profitability relate to the changes of macroeconomic conditions. In their study, they concluded that the momentum strategy exposed investors to undesirable risk. They also specified that the momentum strategy creates a negative economic benefit in its poor economic conditions when the expected market risk is high. On the other hand, the momentum strategy creates positive economic profit in its good economic conditions when the expected market risk is low. Bolton et al. [4] examined the momentum of the Johannesburg Stock Exchange after the financial crisis in 2008 and examined its implications for South African market participants. Their study was conducted to identify the existence of momentum from March 1, 2009 to April 8, 2014 using different momentum indices to simulate possible investment options. In their research, three Momentum Technical indicators, including Simple Moving Average (SMA), Exponential Moving Average (EMA) and Relative Power Index (RSI), were utilized using the index TOP 40 as a proxy for the South African

market. The processing of their research data indicates positive returns for the EMA and SMA index and negative returns for the RSI index. Hashemi and Miraki [10] investigated the excess return on momentum risk in Tehran Stock Exchange. In this study, the excess return on the risk of a momentum strategy from one month to 12 months is tested using Fama-French's three-factor model (1993). The sample includes 128 companies listed in Tehran Stock Exchange during the period of 2004 to 2010. The results of this research show that although the portfolio based on the 9 and 10-month momentum produces a positive and significant return, but the application of the momentum strategy over the period considered did not create an excess risk-return (abnormal return). In other words, the profits of applying momentum strategy are due to higher risk acceptance. Menkhoff et al. [13] presented a vast empirical research of momentum strategies in the foreign exchange market in 48 different countries of the world. To that end, they investigated their research data from January 1976 to January 2010. They found a significant cross-sectional spread in excess returns of up to 10% per year between past winner and loser currencies and this spread in excess returns is not explained by traditional risk factors, it is partially explained by transaction costs and shows behavior consistent with investor under and overreaction.

Wang and Wu [17] studied the relationship between Risk adjustment and momentum sources. They showed that the conventional procedure of risk adjustment by running full-sample time-series Fama–French three-factor regressions is not appropriate for momentum portfolios because the procedure fails to allow for the systematic dynamics of momentum portfolio factor loadings. They proposed a simple procedure to adjust risks associated with the Fama–French three factors for momentum portfolios. Using their proposed method, the Fama–French three factors can explain approximately 40% of momentum profits generated by individual stocks and nearly all of momentum returns from style portfolios. Naughton [15] investigated the profitability of momentum investment strategies for companies listed in the Shanghai Stock Exchange. They also investigated the role of trading volume to examine whether there is any relationship between stock returns and past trading volume for Chinese companies. They found evidence of substantial momentum profits during the period 1995 to 2005 and that momentum is a pervasive feature of stock returns for the market investigated in their research. Their findings suggest that investors can generate superior returns by investing in strategies unrelated to market movements. They also investigated the potential of past volume to explain momentum profits, and found no strong link between past volume and momentum profits. Their findings also showed a strong momentum effect around earnings announcements but the magnitude of these returns is small in relation to the average monthly returns earned in the early months following portfolio formation. Asem [2] studied the relationship between dividends and price momentum. His research results show that momentum profits are lower among dividend-paying firms than their non-paying counterparts due to differences in losers' returns. Additionally, dividend maintenance is associated with higher returns for losers but not for winners. Finally, buying winners that increased their dividends and shorting losers that decreased their dividends enhances momentum profits. McKnight and Hou [12] evaluated the momentum profits by using the book-to-market ratio to market value, size, and coverage of the analyst, and used these variables as agents for the profit of momentum, they concluded that the momentum profits are related to all three factors in adverse, and the book-to-market ratio to market value, analysis coverage, and size are importance.

3 Research Method

Regarding the scientific division, this research is an applied research objectively and also research method is comparative; i.e., the research is conducted based on past information and since the purpose of this study is to investigate the impact of the momentum factor on returns Stock in different market

conditions, so this research can be in the field of descriptive research. The used research hypotheses in this study are stated as follows:

Hypothesis 1: Momentum in normal market conditions affects the stock return of companies listed in Tehran Stock Exchange.

Hypothesis 2: Momentum in upside market conditions affects the stock returns of companies listed in Tehran Stock Exchange.

Hypothesis 3: Momentum in the downside market conditions affects the stock return of companies listed in Tehran Stock Exchange.

The research is conducted in the deductive-inductive framework so that theoretical foundations and research background through library studies, articles and related sites are conducted deductively and data collection for confirmation and rejection of hypotheses is conducted inductively.

Data required is first collected through financial statements and attachment notes of the financial statements of the companies listed in Tehran Stock Exchange using the website of www.codal.ir and the initial information on the stock exchange (using Rahavard Novin software). Excel software is used to calculate the variables of the research and Eviews10 statistical software is used to analyze the hypotheses and conclusions and the time series model (120 months) is used for testing the hypotheses.

In this research, a targeted sampling method (systematic elimination) has been used for sampling. For this purpose, all companies of statistical population that have the following conditions are selected as the sample and the rest are eliminated.

1. The financial year of the company to be led to March 20th each year.
2. The company does not have an Operating delay more than 3 months.
3. The company not to be had the change of year or the change of financial period during reviewing period.
4. Companies not to be the member of financial intermediation, investments, insurance and banks.
5. Considered items to be available.

According to the restrictions imposed on companies listed in Tehran Stock Exchange, 98 companies have been selected.

3.1 Statistical model of research and method of measuring variables

To test the hypothesis of the research, the portfolio method has been used based on the average returns of past and the Carhart four-factor model. Carhart model is as follow by adding the factor of momentum to the Fama and French three-factor model:

$$E(R_p - R_f) = b_p E(MP) + s_p E(SMB) + hp\, E(HML) + w_p E(WML) \quad (1)$$

The components of this model are:

E (MP) = Market Premium

E (SMB) = Small minus Big

E (HML) = High Book to Market minus Low Book to Market

E (WML) = Winner minus Loser

And the coefficients h, s, b and W are the risk measure associated with each of the four factors above. After the portfolios of stocks of companies, the following equations are used to calculate the independent variable and the controlled variables, including Market Premium (MP), Small minus Big (SMB), High Book to Market Minus Low Book to Market (HML) and Winner Minus Loser (WML):

$$MP = R_m - R_f \quad (2)$$

$$SMB= ((SHW-BHW) \times (SHL-BHL) \times (SLW-BLW) \times (SLL-BLL)) \times 1/4 \quad (3)$$

$$HML= ((SHW-SLW) \times (SHL-SLL) \times (BHW-BLW) \times (BHL-BLL)) \times 1/4 \quad (4)$$

$$WML= ((SHW-SHL) \times (SLW-SLL) \times (BHW-BHL) \times (BLW-BLL)) \times 1/4 \quad (5)$$

The companies' portfolio method is that at first, all the companies investigated are ranked from low to high based on the stock market value (reagent of size of company) and then divided into two equal, small and large groups. Then, once again, the companies are arranged independently on the basis of the annual book value ratio to market value (B / M) of stock (reagent of value or the growth of stock) and placed into two equal categories, called low (L) and high (H).

The low ratio represents the growth stock and its high ratio represents the growth stock. Finally, for the factor of winner minus loser, all of the stocks in the sample once again is ranked according to the price return and as the two previous factors will be classified into the two groups of winner stocks (50% of the companies with the highest returns) and the loser stocks (50% of the companies with the lowest returns). Therefore, by implementing three times successive categorizing of companies, eight portfolios will be obtained as follows, which will be used in the above equations, and the companies' stock in each year will be in one of these portfolios.

Table 1: Categorizing portfolio of companies

Content of portfolio	Symbol of portfolio	Number of portfolio
Big company, high B / M ratio and loser	BHL	1
Small company, high B / M ratio and loser	SHL	2
Big company, low B / M ratio and loser	BLL	3
Small company, low B / M ratio and loser	SLL	4
Big company, high B / M ratio and winner	BHW	5
Small company, high B / M ratio and winner	SHW	6
Big company, low B / M ratio and winner	BLW	7
Small company, low B / M ratio and winner	SLW	8

3.2 Research variables

The only independent variable used in this study is Winner minus Loser.

Winner minus Loser (WML): The factor of winner minus loser represents the difference between the portfolio returns of the winner stocks and portfolio returns of loser stocks which is called "profitability factor" in the regression formula provided by Carhart.

Control variables used in this paper are as follows:

Market Premium (MP): The factor of market risk premium which is the beta factor provided by the CAPM model, this factor is measured by (R_m- R_f), which represents the excess of return of market portfolio to the risk-free return rate. And in the regression formula provided by Fama and French, it is called "market factor".

In this research, Tehran Stock Exchange Index is used as a market return. The total index of Tehran Stock Exchange is calculated based on the difference of end of the month index minus the beginning of the month index, divided by the beginning of the month index. The risk-free index (R_f) is also the maximum estimated interest rate over the years under study using TOPSIS software.

Small minus Big (SMB): The factor of small minus big represents the difference between portfolio stock returns of small companies and stock portfolios of big companies, which is called the "size factor" in the regression formula provided by Fama and French.

High Book to Market Minus Low Book to Market (HML): The factor of high book to market minus low book to market represents the difference between portfolio stock returns of companies with the book value ratio to market value and stock portfolios of companies with the book value ratio to low market value, which in the formula of Regression provided by Fama and French, it is called "value factor".

The dependent variable of stock return is calculated as (R_p-R_f), which the maximum interest rate estimated in the research years is calculated using the TOPSIS software as risk-free interest rate (R_f) and portfolio return monthly.

4 Research Findings

In the table below, in addition to the descriptive indexes of the research variables, the results of Jarque-Bera test are also shown. Considering the probability of the Jarque-Bera test, the assumption of normality of distribution of variables is accepted.

Table 2: Descriptive statistics of the research variables

Variables	Winner minus Loser	Market Premium	Small minus Big	High Book to Market Minus Low Book to Market	Stock returns
Mean	181.89	0.511	-712.39	-112.12	47.14
Medium	194.7	-0.655	-139.05	285.95	49.3
SD	65.66	5.65	20.62	1.26	1.26
Jarque-Bera	3.49	5.48	2.92	1.97	3.48
Probability	0.078	0.064	0.081	0.089	0.075

4.1 Test results of the first hypothesis

The purpose of the first hypothesis is to investigate the impact of momentum in normal market conditions on stock returns of companies listed in Tehran Stock Exchange, which the results of Table 3 is used for its testing.

Table 3: The results of testing the first hypothesis

Variable	Coefficient	t-statistic	P-value
C	1.708025	5.989634	1.0000
MP	-0.008156	-1.067120	0.2354
WML	0.028661	4.547921	0.0037
HML	-5.423 E-8	180.7666	0.0000
SMB	8.33 E-06	0.520625	0.5764
AR(1)	1.000000	1.493769	0.1380
R^2=0.857	R^{-2}=0.851	F=137.3358 Prob=0.0000	D-W=1.82

As it is shown in Table 3, according to the t-statistic, the variable of winner minus loser (WML) is statistically (t = 4.54) valid. Also, the estimated F-statistic (137.33) is larger than the value of F distribution table (2.45), so all the coefficients of the opposite model are zero and the hypothesis H_1 based on the non-zero of all coefficients is confirmed. The results of the adjusted coefficient of determination indicate that 0.85 changes in stock returns (dependent variable) are explained by the winner minus loser variable and control variables. According to the initial estimation of the model and the low Durbin-Watson statistic, which indicates the successive autocorrelation of the sentences of errors, in order to solve this problem, the first-order auto regressive method is used and the generalized least squares is again used to be solved the problem of autocorrelation of model and heterogeneity of the variance. Therefore, the value of Durbin-Watson static is 1.82, which indicates the lack of correlation of errors. Also, according to Table 4, the model does not have the problem of heterogeneity of variance (without intercept and timing trend). Statistically, as nR^2 =7.89 <X_α^2 $P =$ 9.48. So according to the distribution table X^2 at the 5% level and the degree of freedom P, its value is

9.48 which according to calculated nR^2, hypothesis H_0,i.e the existence of homogeneous variance, is not rejected and there is no heterogeneity of variance.

Table 4: Test of heterogeneity of variance of the first hypothesis

Heterogeneity of variance-Breusch-Pagan-Godfrey	
Obs*R-Squared=7.89	X^2 (0.05 , 4)=9.48

Also, to avoid false regression, the reliability test (without intercept and timing trend) of all variables of the first hypothesis is carried out, which results in Table 5 shows that all variables are reliable (stationary) at the level of 1% and 5% and the estimated model has no false regression.

Table 5: Reliability test of variables of first hypothesis

Variable	Dickey-Fuller test	Test critical values
WML	-9.93	At the level of 1% reliable (-3.48)
MP	-6.73	At the level of 1% reliable (-3.48)
SMB	-7.04	At the level of 1% reliable (-3.48)
HML	-10.91	At the level of 1% reliable (-3.48)
Y	-3.16	At the level of 5% reliable (-2.88)

4.2 Test results of the second hypothesis

The purpose of the second hypothesis is to investigate the impact of momentum in upside market conditions on stock returns of companies listed in Tehran Stock Exchange, which the results of Table 6 is used for its testing.

Table 6: The results of testing the second hypothesis

Variable	Coefficient	t-statistic	P-value
C	4.074595	6.642331	0.0000
MP	0.065722	1.257331	0.4116
WML	0.045325	4.567210	0.0048
HML	-3.23 E-07	-0.101892	0.9944
SMB	-8.35 E-08	-0.005880	0.9972
AR(1)	0.893141	12.66893	0.0000
$R^2 = 0.805$	$R^{-2} = 0.786$	F= 41.5085 Prob=0.0000	D-W=2.07

As it is shown in Table 6, according to the t-statistic, the variable of winner minus loser (WML) is statistically (t = 4.56) valid. Also, the estimated F-statistic (41.50) is larger than the value of F distribution table (2.53), so all the coefficients of the opposite model are zero and the hypothesis H_1 based on the non-zero of all coefficients is confirmed.

The results of the adjusted coefficient of determination indicate that 0.78 changes in stock returns (dependent variable) are explained in upside market conditions by the winner minus loser variable and control variables. According to the initial estimation of the model and the low Durbin-Watson statistic, which indicates the successive autocorrelation of the sentences of errors, in order to solve this problem, the first-order auto regressive method is used and the generalized least squares is again used to be solved the problem of autocorrelation of model and heterogeneity of the variance. Therefore, the value of Durbin-Watson static is 2.07, which indicates the lack of correlation of errors. On the other hand, the problem of heterogeneity of variance is investigated which indicates that the model does not have the heterogeneity of variance (without intercept and timing trend) as Table 7. Statistically, as nR^2 =5.61 $< X_\alpha^2$ p=9.48. So according to the distribution table X^2 at the 5% level and the degree of freedom P, its value is 9.48 which according to calculated nR^2, hypothesis H_0,i.e the existence of homogeneous variance, is not rejected and there is no heterogeneity of variance.

Table 7: Test of heterogeneity of variance of the second hypothesis

Heterogeneity of variance-Breusch-Pagan-Godfrey	
Obs*R-Squared=5.61	X^2 (0.05 , 4)=9.48

Also, to avoid false regression, the reliability test (without intercept and timing trend) of all variables of the second hypothesis is carried out, which results in Table 8 shows that all variables are reliable (stationary) at the level of 1% and 5% and the estimated model has no false regression.

Table 8: Reliability test of variables of second hypothesis

Variable	Dickey-Fuller test (Phillips-Peron test)	Test critical values
WML	-5.54	At the level of 1% reliable (-3.55)
MP	-6.88	At the level of 1% reliable (-3.55)
SMB	-7.46	At the level of 1% reliable (-3.55)
HML	-7.11	At the level of 1% reliable (-3.55)
Y	(-3.72)*	At the level of 5% reliable (-3.49)

* The number in parentheses is based on the Phillips-Peron test.

4.3 Test results of the third hypothesis

The purpose of the third hypothesis is to investigate the impact of momentum in downside market conditions on stock returns of companies listed in Tehran Stock Exchange, which the results of Table 9 is used for its testing.

Table 9: The results of testing the third hypothesis

Variable	Coefficient	t-statistic	P-value
C	0.606122	0.003215	0.9976
MP	-0.008405	-0.699775	0.7419
WML	0.014537	30.86412	0.0012
HML	-7.37 E-08	-0.073626	0.5249
SMB	-7.92 E-08	-0.077647	0.9455
AR(1)	0.999991	2.528575	0.0142
MA(1)	0.728462	5.615644	0.0000
R^2=0.891	$R^{-2} = 0.879$	F=77.8461 Prob=0.0000	D-W=2.35

As it is shown in Table 9, according to the t-statistic, the variable of winner minus loser (WML) is statistically (t = 30.86) valid. Also, the estimated F-statistic (77.84) is larger than the value of F distribution table (2.53), so all the coefficients of the opposite model are zero and the hypothesis H_1 based on the non-zero of all coefficients is confirmed. The results of the adjusted coefficient of determination indicate that 0.87 changes in stock returns (dependent variable) are explained in downside market conditions by the winner minus loser variable and control variables. According to the initial estimation of the model and the low Durbin-Watson statistic, which indicates the successive autocorrelation of the sentences of errors, in order to solve this problem, the first-order auto regressive method is used and the generalized least squares is again used to be solved the problem of autocorrelation of model and heterogeneity of the variance. Therefore, the value of Durbin-Watson static is 2.35, which indicates the lack of correlation of errors. On the other hand, the problem of heterogeneity of variance is investigated which indicates that the model does not have the heterogeneity of variance (without intercept and timing trend) as table 10. Statistically, as nR^2=4.18 $<X_\alpha^2$ P=9.48. So according to the distribution table X^2 at the 5% level and the degree of freedom P, its

value is 9.48 which according to calculated nR^2, hypothesis H_0,i.e the existence of homogeneous variance, is not rejected and there is no heterogeneity of variance.

Table 10: Heterogeneity of variance of the third hypothesis

Heterogeneity of variance-Breusch-Pagan-Godfrey	
Obs*R-Squared=4.18	X^2 (0.05 , 4)=9.48

Also, to avoid false regression, the reliability test (without intercept and timing trend) of all variables of the third hypothesis is carried out, which results in Table 11 shows that all variables are reliable (stationary) at the level of 1% and 5% and the estimated model has no false regression.

Table 11: Reliability test of variables of third hypothesis

Variable	Dickey-Fuller test	Test critical values
WML	-7.47	At the level of 1% reliable (-3.53)
MP	-5.43	At the level of 1% reliable (-3.53)
SMB	-7.86	At the level of 1% reliable (-3.53)
HML	-7.94	At the level of 1% reliable (-3.53)
Y	-8.23	At the level of 1% reliable (-3.53)

5 Conclusions

Based on the results of the first hypothesis test, momentum in normal market conditions has a direct and positive impact on the stock return of companies listed in Tehran Stock Exchange and its impact is 2.8%. Based on the results of the second hypothesis test, momentum in upside market conditions has a direct and positive impact on the stock return of companies listed in Tehran Stock Exchange and its impact is 4.5%. Based on the results of the third hypothesis test, momentum in downside market conditions has a direct and positive impact on the stock return of companies listed in Tehran Stock Exchange and its impact is 1.4%. The results of the positive and direct impact of momentum on stock returns in each of the different market conditions (normal, upside and downside) indicates the principle of investors' insatiability in Tehran Stock Exchange seeking to maximize its return on investment with a certain risk that in a downside mode of market, their insatiability exits less and faster than their momentum conditions, which is a reason for investors' loss evasion in this situation.
Considering that momentum strategy is one of the important strategies in portfolio management, informing the results of this research causes investors as momentum traders to be paid attention to the effects of momentum on stock returns on the existence of a particular pattern in stock returns in making their decisions that these specific patterns in the past will continue in a certain period of the future. For future research, this study suggests the following directions:

1. In this research, the effects of momentum on stock returns are examined using the Carhart four-factor model. Therefore, in the following research, it can study and consider the impacts of momentum on stock returns using a five-factor model.

2. In this research, the stock market value has been used as the size of the company, so in future researches; it can use other variables, such as sales, total assets of the company, and study and consider its effects on the research hypotheses.

3. In this research, the impacts of momentum as one of the portfolio management strategies have been used, so in the future research, it can study and consider the effects of reverse strategy on stock returns.

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