Modern Applied Science; Vol. 11, No. 4; 2017
ISSN 1913-1844 E-ISSN 1913-1852
Published by Canadian Center of Science and Education

Assessment of Profitability Based on Reverse Strategy in Companies Listed in Tehran Stock Exchange

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Received: July 22, 2016 Accepted: August 1, 2016 Online Published: January 30, 2017

doi:10.5539/mas.v11n4p39 URL: http://dx.doi.org/10.5539/mas.v11n4p39

Abstract

Basically, investors in general and investors in securities including shares or bonds, in particular, are always looking for reliable and reasonable models that can help them choosing the number and time of the transaction of purchase and sale of their investments in order to maximize yields and guide them properly. In the last century with the development of financial markets, especially the stock market and more diversified securities of transactions in these markets, and more participation of larger groups of people in stock, their demands have become more important. Two important and widely used strategies among analysts include reverse and momentum strategies which against each other. They predict future performance using past performance. Momentum strategy believes that recent trends continue, but reverse strategy believes that recent trends will return.

In this study conducted in a six-year period between 2009 and 2014 and its portfolio is made up, the results of this study in the Tehran Stock Exchange which has been due to two hypotheses showed that the mean abnormal return of loser and winner portfolios are positive and negative, respectively, and hypotheses have been confirmed.

Keywords: profitability, reverse strategy, winner portfolio, loser portfolio, momentum strategy

1. Introduction

Each investor when entering the capital market is looking to find and use strategies to be able to win the market and gain excess returns. There are two types of trading and portfolio management strategies in capital markets including momentum and reverse strategies. Momentum is a concept in physics which states that a moving object tends to stay in motion, unless an external force is exerted on it which is the same as Newton's first law. The example of this concept in capital market is that a price trend tends to stay the same until an external force stops it. In contrast, the reverse strategy believes that majority of the market are wrong and the recent trends in prices will return. Therefore, to achieve excess returns, we have to be patient and act with courage in the opposite direction of the market.

In total, these strategies seek to identify trends using different criteria and enjoying them.

2. Problem Statement

Basically, investors in general and investors in securities including shares or bonds, in particular, are always looking for reliable and reasonable models that can help them choosing the number and time of the transaction of purchase and sale of their investments in order to maximize yields and guide them properly. In the last century with the development of financial markets, especially the stock market and more diversified securities of transactions in these markets, and more participation of larger groups of people in stock, their demands have become more important. To meet these needs of economic experts is presented the numerous templates, which can be categorized it into two major groups:

1- Fundamentalism models: Supporters of this model believe that the return on an investment is always in

relation to certain factors. By knowing them and the relationship between them and the type of impact on stock prices which emerges on shares, price and their volatility in stock, and predicting the amount and the motion of these factors in future, the expected return on an investment can be achieved.

2- Technical analysis model: Supporters of this model are of the opinion that in return on investment and in particular the stock returns so does intervention a variety factors of economic, or political or social - cultural that can never be predicted finely them and built a solid model based on it.

3- Technical analysts enjoyed of the strategies for their analysis, which are classified in two groups:

1) Aligned theories strategies with market trends and antithetic theories with market trends.

2) The strategy of the theory of moving averages and breakpoints.

Today, in the capital markets, especially in the stock exchange, both groups of analysts are the active and dramatic presence.

3. Research Topic History

A survey in Iran in financial investigations, no similar research approaches were found on the technical analysis in general and aligned and antithetic strategies. But the present study is conducted directly and indirectly in various forms in almost all major world stock exchanges such as New York, London, Japan, France, etc.; among about 20 articles and 3 theoretical studies that the researcher achieved, the following studies carried out at different times (short term, medium term and long term) provide us the resources for the present study:

- In this study of Bruce N. Lehmann, the portfolio formed on the basis of their returns in a week and all shares have returns above average in the winner portfolio, and which ones were have returns under average were placed in the winner portfolio. Then, be measure returns of these two portfolios for next week, which was found significant difference in average annual abnormal return in two portfolios. Therefore, the antithetic strategy acts right in the short term.

- In fundamental research of Narasinhanjegadcesh, which was conducted in the monthly period between 1982 and 1929, the winner and loser portfolios respectively, were included 10% of which have returns above average, and 10% of the returns under average. Therefore, the antithetic strategy acts right in the short term.

- In research conducted by Sheridam Titmam, the portfolios formed on the basis of their returns during the past six months, which 10% of shares that had the highest returns were placed in the winner portfolio. While 10% with the lowest returns are found in the loser portfolio showed that the portfolio evaluation data during the coming six-month period of 1962 to 1989 represents a significant difference in favor of the winner portfolio. That is the antithetic strategy acts right in the medium term.

- In research conducted by Narasimhanjegadeesh in the annual period between 1929 to 1982, which were identified in it, 10% of the winner portfolio and 10% of the loser portfolio showed that the antithetic strategy acts right in the long term.

- In Mohsen Salvati research, which was carried out during the years 1999 to 2003, which in this study, the researchers are looking for test patterns of decision making in the capital market of Iran, especially Tehran Stock Exchange with the use and emphasis on technical analysis models, because the use of fundamental concepts for some investors is difficult. Thus, by providing technical analysis can be helped to extend the culture of investing in Iran. Research hypotheses: By using of investment strategy can be achieved to abnormal returns in Tehran Stock Exchange. The loser portfolio has a positive abnormal returns average. The winner portfolio has a negative abnormal returns average. The difference between above average is negative significantly. Conclusions and recommendations: Although the contrarian strategy in some sections has achieved positive abnormal returns, but momentum strategy abnormal returns was much higher than that, and in any of the 16 above tests is not correct contrarian strategy hypotheses in Tehran stock exchange. Therefore, the momentum strategy in short-term, medium-term and long-term periods is profitable. The implicit test result (positive abnormal returns achieve) is evidence of the relative effectiveness of Tehran Stock Exchange.

4. Analytical Model and Variables Measuring Method

In the analysis, the variables are divided into two groups with different entities: independent and dependent variables which can be quantitative or qualitative.

Research Model:

$$RET^{S}_{P,t} - R_{Ft} = \alpha^{S}_{P} + \beta^{S}_{P} (R_{Mt} - R_{Ft}) + S^{S}_{P} (SMB_t) + H^{S}_{P} (HML_t) + e_{pt}$$

4.1 Dependent Variable

Difference between strategic portfolio and risk-free rate of return: The dependent variable in this study is the portfolio strategy yield difference over a risk-free return and period. This variable represents the excess stock return over the risk-free return that determines other risk factors. The variable is calculated as follows:

$$RET^{S}_{P,t} = \alpha_0 + \beta_{1,S} RET^{S}_{P,t-ml} + \varepsilon_t$$

RET: It is a strategic portfolio returns in a period, which is calculated by the difference between winners and losers portfolio.

4.2 Independent Variables

The main variables of the model are (Rm - Rf) t, SMBt is the difference between return and risk-free interest rate, (market factor) and HTML is the difference between the average yield of stock portfolio and the ration of book value to market value.

Rf: Provisional interest rate, which is equal to the interest rate of provisional government bonds in period t.

Rm: It is equal to the rate of total return on the Tehran Stock Exchange (general index) to calculate this returns has been use of the cash index returns and the price of the Tehran Stock Exchange (TEDPIX), which is as follows:

Price index and cash returns or the same index of total revenue with the TEDPIX symbol from April 1998 calculated on the Tehran stock exchange and has been published. Changes in these indicators are representing the total stock returns and influenced from the price changes and return of cash. In other words, this index is reflects the total return obtained from investing.

$$Rm = \frac{TEDPIXt - TEDPIXt\text{-}1}{TEDPIXt\text{-}1}$$

That to obtain Rm will use of the index of Tehran Stock Exchange.

Stock returns risk factor related to the SMBt size: Stock return risk factor that is related to the size of the company, which is explaining stock returns by size of company and is equal to the difference between the average returns of stock portfolio with small size and the average returns of stock portfolio with large size.

Stock returns risk factor related to the HMLt size: Stock return risk factor that is related to the ratio of book value to market value of the company in the month t. That is equal to the difference in average return of stock portfolio with the ratio of book value to high market value, and the average returns of stock portfolio with the ratio of book value to low market value.

SMB: Stock return risk factor that is related to the size of companies and is the difference between simple average returns of three small portfolios (S/L, S/M, S/H) and the simple average market of three large portfolios (B/L, B/M, B/H). So SMB obtained from the difference between the stock return of large and small portfolios, in terms of the ratio of book value to market value are almost the same weight. So the effect of this ratio is independent.

$$SMB = (SH + SM + SL)/ 3 – (BH + BM + BL)/ 3$$

HML: Stock return risk factor that is related to the ration of book value to market value of the companies, and as the simple average market difference between two portfolios has the highest ratio of book value to market value (S/H, B/H) and the simple average return of two portfolio is defined as the least ratio (S/L, B/L). Both parts of HML portfolio returns have the highest-lowest ratio of book value to market value with almost identical average size. Thus, difference in the return of the two portfolios is largely independent of the influence of the size factor in stock returns.

$$HML = (SH + BH/ 2) – (SL + BL/ 2)$$

5. Research Hypotheses

Secondary Hypothesis 1: The loser portfolio has a positive mean abnormal return.

Secondary Hypothesis 2: The winner portfolio has a negative mean abnormal return.

6. Population and Statistical Sample

The study population includes all lists of top fifty companies announced by stock since the beginning of 2009 until the end of 2014. Based on antithetic strategy test method, two criteria in choosing subjects are obtained from the population:

1) Shares that is located in the list of top fifty companies announced by the Tehran Stock Exchange at least for once during the test period.

2) This company at the start of the test, 21 March 2009, listed on the Stock Exchange board and placed the transaction, because for the calculation of systemic risk is requires to the presence information of 72 periods of this stock.

In this study, after sampling and obtain the value of variables realized returns and normal returns, and after subtracting of these two and obtain abnormal returns for any period (time) at the end of the period, the criteria for our decision will be winners and losers portfolios abnormal return average during the period. Therefore, main technique was used in this study is average. It should be noted that for the calculation of systemic risk, which calculates the normal returns of an underlying model (which in this study is William Sharpe's capital asset pricing model) is required to calculate the covariance of returns stocks making up the portfolio and stock indexes, as well as the index variance during the period.

According to the antithetic test strategy, the test strategy of this study is as follows:

1. We will list shares of all companies listed on the Tehran Stock Exchange.

2. We sorted these shares based on their total return (based on the formula stated in the describing the problem section) at a time in the end (the period of the portfolio formation).

3. The number of shares that have the lowest average return in the course of formation assign to the loser portfolio, and the number of shares that are the highest average returns in this period, we assign to the winner portfolio.

4. We are determined the winners and losers portfolio return, over a period of beginning time (the test period).

5. We will repeat the all analysis again. Starting from step 1, but by moving to a period (ahead period), and after a number of repetitions, we stopped the work.

6. We calculate the abnormal returns of winners and losers portfolios by subtracting the total return of them from the portfolio returns are comparable with the level of risk and gain abnormal average return of both portfolios. To properly antithetic strategy should be:

- The loser portfolio has a positive mean abnormal return.
- The winner portfolio has a negative mean abnormal return.

Table1. The definition of regression model variables

Brevity	Definition
(RET –Rf)t	It is the difference between portfolio strategy returns in a period and the rate of return of risk-free i, in month t.
(Rm – Rf)t	Difference between stock market returns and risk-free interest rate.
SMBt	Return on equity risk, which is related to the size of the companies.
HMLt	Return on equity risk, which is the related to the ratio of book value to the market value of the company in the period t.

The results show that the amount of abnormal returns (RET -Rf) in the loser portfolio is positive and equal to 127.394, and in the winner portfolio group, it is negative and equal to -132.616. The variable of difference between the value of stock market returns and risk-free interest rate is almost the same in both groups; it is equal to 43.236 and 43.557 in the loser and winner portfolios, respectively.

In the risk variable, SMBt return on equity (which is related to the size of companies), the value obtained show that the loser portfolio has achieved a much higher amount of 75.862, compared with the winner portfolio group (-10.299). In HMLt varying risk-return stock (which is related to the ratio of book value to market value companies), the amount recovered in the winner portfolio (0.6863), is higher than the loser portfolio (0.2380).

Table2. The main variables descriptive indexes and model variables

Indexes		**Average**	**Middle**	**Max**	**Min**	**Standard deviation**
Groups	**Variables**					

Loser portfolio		(RET –Rf)t	127.394	103.789	261.341	2.618	57.645
		(Rm – Rf)t	43.236	41.369	87.715	-8.791	34.050
		SMBt	75.862	51.671	279.742	11.518	58.551
		HMLt	0.2380	0.1825	1.1751	0.0218	0.2057
Winner portfolio		(RET –Rf)t	-132.616	-87.890	-1.973	-615.789	132.022
		(Rm – Rf)t	43.557	41.369	87.716	-8.791	33.045
		SMBt	-10.299	-13.137	41.107	-26.493	11.322
		HMLt	0.6863	0.5872	2.4510	0.0132	0.5094

The correlation values obtained show that there is a significant correlation between all variables ($p<0.01$). The correlation values obtained show that there is a statistical relationship between all independent variables in both groups, but the correlation values obtained is average, which means there is no problem and high linearity between variables and the linearity problem can be ignored.

Table3. The correlation matrix between the independent variables

Groups		Variables	(Rm – Rf)t	SMBt	HMLt
Loser portfolio		(Rm – Rf)t	–		
		SMBt	0.806**	–	
		HMLt	0.578**	0.574**	–
Winner portfolio		(Rm – Rf)t	–		
		SMBt	0.503**	–	
		HMLt	-0.391**	-0.372**	–

Note: Significant at the confidence level of 99%: 0.01>P**

Significant at the confidence level of 95%: 0.05>P*

Test results in the loser portfolio (Table 4) show that the regression model is meaningful, and F probability value is less than 0.001 which means that the independent variables have been able to make significant changes in dependent variables. The resulting coefficient of determination is 0.111 which shows that independent variables have been able to determine about 11% of the dependent variable changes.

Test results in the loser portfolio show that the SMB variable is effective on the abnormal returns and can be significantly predict it (0.01>P). The results showed that HML and Rm-Rf is unaffected on the abnormal returns. The SMBt variable impact on the abnormal returns is positive, which indicates an increase in SMB, which leads to the increase abnormal returns and vice versa.

Table4. Model estimation results of research in the losers group

Variables	Coefficient	Standard error	T-statistic	Prob
(Rm – Rf)t	-0.6743	0.4310	-1.5646	0.1204
SMBt	0.9167	0.1696	5.4038	0.0000
HMLt	80.0848	54.7164	1.4636	0.1460
Fixed amount	-44.2622	31.5170	-1.4044	0.1628
Coefficient of determination=0.111				
Adjusted coefficient of determination=0.089				
Durbin-Watson=2.12				
F-statistic=4.920			Prob=0.0029	

7. Conclusion

According to the results obtained, the mean abnormal return has also been reported in the loser portfolio; the mean abnormal return in the loser portfolio is 12.394 and positive. In accordance with the test results mean (t-test to compare mean values of a given quantity) where the mean abnormal return in the loser portfolio is

compared with zero, we conclude that mean abnormal return in the loser portfolio is significantly greater than zero and the value obtained is positive; thus, the first hypothesis is confirmed.

The average results and t test show that the winner portfolio, which has a negative abnormal returns average (0.001>P). The abnormal returns average in the loser portfolio is equal to -132.616 and is negative, and in accordance with the test results of compare average (t test was used to compare average variables with a given quantity), in which the abnormal returns average in the winner portfolio compared with a value of zero, we conclude that the amount of abnormal return average in the winner portfolio is less than zero significantly, and the obtained value is negative, and the result is confirmed the second hypothesis.

8. Suggestions

Given that the empirical analysis of profitability, based on reverse strategy is the most important and widely used strategy in portfolio management, the further research in this field can be great help to investors and users of financial markets. In the same direction and with the results that have been inferred from this research, as well as for continued future studies about these strategies, we are offered the following suggestions for further investigation:

- Considering the size and ratio of BTM to better explain the momentum and reverse.
- Conducting tests to check and find the reasons for the effects of momentum and reverse.
- Research on evaluation of transaction costs that may be beneficial or not.
- Continuing future financial research in the field of behavioral finance which would be very critical.

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