



Assessing the Behavioral Reaction of Investors to the Price Change Using the Speed of Price Adjustment Approach to the General Information and Its Relation with Future Return

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ABSTRACT

In Recent Decades, The Financial Sphere has entered a New Era of Contempt for Some of the Assumptions of Modern Economics and Finance. One of These Assumptions is the Rationale of the Investors, which has been Seriously Challenged and Is Now Being Strengthened by the Fact That Prices are Determined more by Attitudes and Psychological Factors than for Fundamental Variables and Therefore the Study of Market Psychology has Become More Important.

The Purpose of This Research is to assess the Reaction of Investors to Price Changes by Measuring the Speed of Price Adjustment Compared to the General Information in Tehran Stock Exchange and a Model for Yielding Additional Returns in Futures. The five-year Research Period is from 2011 to 2016. The Statistical Population of the Study is the Companies listed in Tehran Stock Exchange and the Results Show that the Rate of Adjustment of Prices is Different from Each other Based on Specific Company Variables, and the Difference in the Rate of Price Adjustment can Cause Make Extra Returns.

Keywords:

Speed of Price Adjustment, Excess Return, Over Reaction, Under Reaction.

1. Introduction

The theory of efficient market hypothesis states that all market information is reflected in prices. This phenomenon or, in other words, such a claim is very interesting for scholars, because if such a claim is true, there will no longer be an analysis of the information about companies as well as economic factors affecting their value. In this way, investment knowledge and related activities will no longer be necessary, since gaining or achieving risk adjusted rate of returns will not be possible more than the return of a portfolio appropriate to the securities index. An important part of the market hypothesis is the direct adjustment of prices in the face of new information and the main topic discussed in this paper.

The purpose of this paper is not to confirm the efficiency or ineffectiveness of the market, but the general concept of effective markets and its influential forces on how these forces affect the behavior of investors. In addition, the semi-strong form and the market efficiency hypothesis are also studied, with the assumption that the market reacts to new information immediately. If this is true, then we can see the phenomenon of immediate reaction to stock prices.

2. Literature Review

Critics of modern financial theory believe that some of the exceptions observed in financial markets are unusual in any rational model of risk and return (Barberis & Thaler, 2003). In contrast, some proponents of modern financial theory believe that there may be exceptions in the market, but observing these exceptions is not a testament to the irrational behavior of economic factors, nor the violence of market efficiency, but rather more because of the collection and incorrect information analysis or false definition of systematic risk (Hon and Tonks, 2003).

Further, behavioral finance and prospect theory, also consistent with behavioral economics (in general) and with Simon's descriptions (in particular), identify specific hypotheses in the traditional financial wisdom, which empirically and analytical are inefficient. This critical literature focuses on the traditional financial wisdom, on the form of the expected utility function, the preference for maximizing the utility and the way in which choices are made through a variety of options. With regard to the prospect theory (especially) and behavioral finance (more generally), Modern Financial Theory is being considered, not because of special errors which exist in the theory

Subjective Expected Utility But rather through institutional parameters. These parameters can include asymmetric and inaccurate information, and can include false individual incentives and rewards (such as the ethical risks associated with the lawyer-client issues in the agency theory), which inefficiency induces optimal behavior.

How investors react to receive information plays a key role in determining the security market efficiency. If the investors' reaction is correct and fast, the securities market is pushing for efficiency; otherwise, the existence of any delays or tribulation in the reaction of investors will increase the distance from the efficient market. The fact is that investors standing in the emotional conditions, cannot respond appropriately, and the existence of specific behavioral modes after the release of latest news has been confirmed in the research. When news about a company is published and the company's stock price changes are insignificant in response to that news, there has been Under reaction, and in fact, when the news is published and the speed of price changes in response to that news is far too much, Overreaction has taken place (Saeedi and Farhanian, 2011).

Price Adjustment

Investigating how stock prices react to marketbased information and company specific information has given special attention in the financial literature. In addition to direction and extent of the price change, another dimension in the market efficiency hypothesis has been formed, which is the speed of price adjustment to the new information. In fact, speed measures the effects of acceleration. If the speed reduces transaction costs, it will result in the efficient allocation of securities between disparate investors and optimize risk sharing. On the other hand, the speed causes price discovery opens up, and more efficiency in price discovery improves financing and investment decisions.

Price adjustment is the process of reflecting information in stock prices. A process that leads closing and equalize the trading price of the stock to its fair value (Amihud and Mendelson, 1987). Market efficiency is related to the quick and complete reflection of the information at prices, therefore, a faster and more complete price adjustment would represent a more efficient market (Kaestner, 2006). According to Fama (1991), in an efficient market, the stock prices observed should immediately respond to new information published in order to reflect the changes occurring in the intrinsic value of the stock. If the process is strong, such

a reflection or modification should take place immediately. The rate of asset price adjustment, based on their intrinsic value, provides direct criteria for overreaction and under reaction measures in financial markets. Various models have been developed by the researchers to determine the speed of stock price and stock price fluctuation in financial markets, which are briefly discussed below.

The approaches to measuring the speed of price adjustment can be categorized in a general way

(Nikoumaram et al., 2015):

- The approach to measuring the speed of price adjustment to the fair value of securities
- The approach to measuring the speed of price adjustment of securities in response to information
 - ✓ speed of price adjustment to the general market information
 - ✓ speed of price to specific company information

Research Background

Chorida and Swaminathan (2000) examined the relationship between volume of transactions and cross-sectional affinities with stock returns. The results of this study showed that the volume of transactions contained important information about cross-sectional self-correlation patterns that was superior to the company size. The empirical tests were based on two analytical models, *Autoregressive model*, similar to that of Brennan et al., and another model based on the Dimson Beta regression.

Ho and Moskowitz (2005) investigated the effect of market friction on cross-sectional return predictability using the average stock price delay in response to information. They found that small, critically acclaimed companies, far from the attention and neglect of market actors, were lagging behind information.

Adam V. Reed (2007) tested implications of diamond and Verrecchia 1987 model. He found that when short selling is costly, stock prices are slow to incorporate private information; and distribution of announcement day returns has a larger average absolute value and exhibits more left skewness when stocks are costly to short sell. Results show that when short selling is constrained, stocks realize 32% less of the total post earnings announcement drifts on the announcement day. In other words the slow reaction to public information caused by costly short selling offers

a partial explanation for the post earnings announcement drift anomaly.

Chiang, Nelling, and Tan (2008) tested the speed of price adjustment between the stock group A and B of the Chinese stock market, including the Shanghai Stock Exchange and the Shenzhen Stock Exchange, from the beginning of 1994 to the end of 2004 using weekly returns. The results of the research indicate that stock prices have a different adjustment speed than general information. Empirical analyzes that determine the speed of adjustment based on weekly and daily data show that stocks with higher information flow and a more refined situation in the market are moderated faster to information.

Lim and Sinnakkannu in (2008), in their paper, examined the stock-exchange speed to public and specific corporate information on the Malaysian stock market between 1990 and 2001. Research findings confirm that different types of announcements have a different price ranging speed. The price adjustment for corporate notifications is between five to seven days, while market wide information's is picked up in prices within one to two days.

Khani and Farahani, in (2008), in a paper titled Performance Evaluation of Tehran Stock Exchange using the price adjustment coefficient, examine the speed of adjustment of information in stock prices using the price adjustment factor and the amount of reflection of new information on prices during the period of 1999 Up to 2005. The results of the research indicate a sluggish reflection of the new information on the stock prices of the companies admitted to Tehran Stock Exchange during the period under review and the minimum time required for full reflection of the information in stock prices is estimated at 17 working days.

Lim (2009) in his article examined the speed of price adjustment to the general market information through a model explanation similar to that of Ho and Musokovitz in 2005. His proposed model is based on a regression for weekly stock returns at the same time and a four week delay with market returns. He also described the factors influencing the delays in stock price adjustments, including market friction, volume of transactions, analyst coverage, institutional ownership, limitation on short sales and the phenomenon of the industry, the degree of access to foreign investors, and finally, a model for providing a speed benchmark Market-adjusted adjustments have consistently been proposed to test the stock price response across global market information across countries.

In another study conducted by Du and associates in (2011), stock market responses to information were reviewed using NYSE, AMEX, and NASDAQ stock exchanges from 1941 to 2007. He followed the approach of regression based on Jegadeesh and Titman (1995), focusing on two stock portfolios. The results of this research confirm the existence of a statistically significant response pattern to public information.

Gottardo (2011) in his study examined the speed of adjustment and volatility in the stock markets and futures contracts between 1995 and 1997. In this study, the speed of price adjustment versus value changes in futures in futures markets of Italy is estimated using the variance of the yield difference periods. The research findings indicate a speed adjustment to the new information within three days.

Ghamari in another study in (2011) examined the relationship between financial reporting quality and the stock price adjustment speed. In the study, the behavioral pattern of stock price adjustment has been tested against latest news. The results of this study by using cross-sectional regression analysis indicated that in the Iranian capital market, the relationship between changes in financial reporting quality and the rate of price adjustment was not significant. By improving the quality of financial reporting, the rate of stock price adjustment significantly changed. It does not indicate that it can be attributed to the inefficiency of the stock exchange.

In another study by Alawi and Mousavi (2011), the net income information and stock price adjustment were investigated. The results of this research show that there is a meaningful relationship between the observed frequencies at the price change on the day of announcing the net (real and predicted) and expected profit, which indicates that the information content of the net profit is predicted.

Hyeonwoo Kim and Deockhyun Ryu (2013) revisit the usefulness of the contrarian investment strategy relative to the momentum strategy in international stock markets. They employ a nonlinear, nonparametric model of relative international stock prices. They obtained that favorable empirical evidence supporting the contrarian strategy for France, Germany, Italy, and UK.

Emrah Arioglu and Koray Tuan (2014) using various estimation procedures employed in the literature for speed of adjustment estimations, they estimate the speed of adjustment of capital structures. Their finding adjusts that, when the speed of adjustment is estimated using pooled OLS regression, the speed of adjustment is estimated at approximately 15%, whereas it is estimated at approximately 49% when the speed of

adjustment is estimated using firm fixed effects regressions.

Maadanchi et al. (2014) examine the behavioral responses of stockholders (overreaction and underreaction) and investment strategies in the Tehran Stock Exchange by assessing the profitability and surplus returns of the three categories of investment strategies, including Momentum and Contrarian strategies, Strategies based on ten specific company variables, and Momentum and Contrarian-based strategies and specific company variables. The results of this research indicate confirmation of higher annual returns of Momentum investment strategy to

Contrarian strategy in all maintenance periods in the short and long term, and the existence of a low reactive phenomenon was confirmed and no more reaction was confirmed.

Maria Hossain (2015) examined if firm level characteristics determine the speed of information adjustments for individual stocks in the Dhaka stock exchange (DSE). An attempt was made to test the significance of the relationship between firm specific variables with the measure of speed of stock price adjustment, with the variable DELAY as its proxy. It was found that three key variables, price to earnings ratio (market performance variable), annual turnover (trade related variables) and closing price (market performance related), had a significant influence on information assimilation. Larger firms and the firms with higher turnover and trading volume assimilated the market-wide news faster when compared to others, as reflected by their negative relationship with DELAY.

Audrey Lim and Jothee Sinnakkannu (2016) reported that the speed of price adjustment in number of days vary from seven to five days of over or underreactions for firm specific announcements while the market-wide announcements are absorbed into the prices within one to two days.

Aditya R. Khanal and Ashok K. Mishra (2017) found that a significant increase in stock prices due to stock dividend announcements. Using daily abnormal returns, they found stock dividend announcement had a positive, significant impact on stock prices. The increase in stock prices due to stock dividend announcement may be due to the market's expectation of an immediate increase in a company's future cash flow which is consistent with the market-signaling hypothesis.

3. Methodology

In the present study, in the time period of the research,

The realm of research is the period of five years, which begins from the beginning of 1391 and ends with the end of 1395, and the spatial realm of research is

Table 1: Strategies based on specific corporate variables

Type of variable	Agent	Variable name	Row
Longitudinal	liquidity	Ratio of the relative volume of transactions	1
	liquidity	Turnover rate	2
	Change ownership	Relative ratio of legal ownership to real	3
	Risk	Yield fluctuations	4
Sectional	Value	Ratio P/E	5
	Size	Market value	6
	Price moderation rate	Delay indicator based on speed of price adjustment	7
	Acceleration	Current price ratio to the highest price in the last 52 weeks	8

the statistical society is different (a few companies entered and a few exit) and selected portfolios (Research samples) have been selected from the statistical society at different times. In this regard, the present research, is Longitudinal and a type of process research.

Tehran Stock Exchange. Implementing strategies based on specific company variables is described in Table (1):

Models Used in Research

The following regression models were used to calculate, measure, and evaluate the speed of price adjustment relative to the general information published in the market as well as the comparison of the efficiency of the strategy resulting from the speed of adjustment compared to the stock market index. 1) Jegadeesh and Titman:

$$r_{i,t} = \mu_i + \sum_{k=1}^k (b_{0,i,k}^t + b_{1,i,k}^t f_{t-1,k}) + e_{i,t}$$

Where:

$r_{i,t}$ Expected unconstrained stock returns

$f_{t,k}$ Realization of the unexpected factor

$e_{i,t}$ =t The company's specific operating time efficiency

$b_{0,i,k}^t, b_{1,i,k}^t$ =t Stock sensitivity to the simultaneous realization and delay of the relevant factor in time

2) LIM

$$r_{i,t} = a_i + \beta_i r_{m,t} + \sum_{k=1}^4 \delta_{i,k} r_{m,t-k} + \varepsilon_{i,t}$$

Where:

$r_{i,t}$ Stock returns

$r_{m,t}$ Weekly Index of Market Returns

If stocks respond faster to market news, β_i will be significantly different from zero, but if none of $\delta_{i,k}$ is different from zero, then it will be that there is no improvement in R^2 by adding market delay returns to regression occurred. However, if the stock price i reacts late, some $\delta_{i,k}$ will be significantly different from zero. The tight model imposes zero-yielding coefficients on the market:

$$r_{i,t} = a_i + \beta_i r_{m,t} + \varepsilon_{i,t}$$

The coefficient R^2 used the equation to calculate the delay criterion in general:

$$DELAY = 1 - \frac{R_{restricted}^2}{R_{unrestricted}^2}$$

3) Dimson Beta

$$r_{i,t} = a_0 + \sum_{k=-k}^k \beta_{i,k} r_{m,t-k} + \mu_{i,k}^k$$

$r_{i,t}$ Stock returns daily

$r_{i,t}$ Stock returns daily

$r_{m,t-k}$ Daily Stock Return Index

$\beta_{i,k}$ Stock adjustment coefficient coincides with market returns

$\sum_{k=1}^k \beta_{i,k}$ Delayed stock adjustment to zero market returns

a log conversion as a moderate delay rate criterion is used as follows:

$$DELAY = \frac{1}{1 + e^{-x}}$$

$$x = \frac{\sum_{k=1}^5 \beta_{i,k}}{\beta_{i,0}}$$

The above delay criterion is between zero and one, with values close to zero, representing a lower delay and closer to one, indicating a further delay in price adjustment. Shares with a higher delay (less) have a lower adjustment speed (Chen & Ray, 2010).

Research hypotheses

The main hypothesis

□ Investors' behavioral responses to general information, as compared to models based on the price adjustment rate, can be explained.

Sub-hypotheses

- ✓ The speed of corporate price adjustment is different from each other.
- ✓ The speed of corporate price adjustment is different from that of general information in large and small companies.

- ✓ The speed of corporate price adjustment is different from that of the general information among the Winners and Losers stocks.
- ✓ The speed of corporate price adjustment is lower than the general information between the more floating stocks.
- ✓ In some places of time, when new information is submitted, it will have the opportunity to obtain abnormal returns.

4. Results

In fact, the main hypothesis can be answered with respect to sub-assumptions. If the speed of adjustment in the two groups of shares is different from the other, then a model for profitability between the two shares can be introduced. Therefore, by examining the speed of adjustment, we try to answer the main hypothesis.

The first sub hypothesis also indicates whether the speed of adjustment is generally different between the two groups. To test such a hypothesis, the speed of adjustment in three hypotheses will be examined. If, however, each of the three sub-second to fourth hypotheses is not rejected, the first sub-hypothesis is also not rejected.

Secondary sub hypothesis test results

The second sub-hypothesis test was performed using daily and weekly data with three models. Thus, there is no significant difference in the speed of adjustment of stock prices of small and large stocks using the Jegadish model. No significant difference was observed with the use of Dimson beta. But using the Lim's model, it is observed that the speed of adjustment of stock portfolios consisting of large companies is further than the stock portfolio of small companies.

Third sub hypothesis test results The summary of the results of the third hypothesis test can be seen in the following table.

The third sub-hypothesis was performed using daily and weekly data with three models. As the results show, there is no significant difference between the speed of price adjustment of portfolios consisting of winning and losing shares using the Jegadish model. No significant difference was observed with the use of Dimson's beta.

But using the Lim's model, it is observed that the speed of price adjustment of portfolios consists of winners is further than losers.

Fourth sub-hypothesis test results

The results of the tests carried out is along the results of other investigations and confirm that there is a significant difference in the rate of price adjustment of the stock with a higher float compared to the stocks with less float.

Due to the higher speed of stock price adjustment of the companies with more float in comparison with less floating stocks it can be said that in this segment of the market, inefficiencies are observed, and there is probability of gaining more returns than the return of the market index.

Table 2: Summary of the results of the second hypothesis test

Variable name	Agent	Used models	Test hypothesis result
Market value	Size	Jegadish et al	There is no significant difference in the speed of adjustment of the stock price between small and the large shares in the weekly periods.
		Beta Dimeson	The absence of a significant difference in the speed of adjustment of the price of small shares compared to larger stocks in the weekly periods
		Lim model	The further speed of adjustment of larger stocks in comparison to smaller stocks in daily and weekly periods

Table 3: Summary of third-hypothesis test results

Variable name	Agent	Used models	Test hypothesis result
Winner or loser	Price changes	Jegadish et al	The absence of a significant difference in the speed of price adjustment of the winners and lesser stock price in the daily period and the significant difference between the winners and losers speed of price adjustment in the weekly periods
		Beta Dimson	Significant difference in the speed of price adjustment of winning shares in response to general information in daily and weekly periods in comparison to losers.
		Lim model	Significant difference in the speed of price adjustment of winners in response to general information in daily and weekly periods in comparison to losers.

Table 4: Summary of the results of the fourth hypothesis test

Variable name	Agent	Used models	Test hypothesis result
22 / Assessing the Behavioral Reaction of Investors to the Price Change Using the Speed of Price Adjustment with more float than stock with less float. Daily and weekly periods.	Stock float Change ownership	Beta Dimeson	There is no significant difference in the speed of stock price adjustment with more float than stock with less float. Daily and weekly periods.
		Lim model	There is a significant difference in the speed of stock price adjustment with more float compared to less floating in daily periods and no difference in the rate of price adjustment in weekly periods.
			Further speed of price adjustment in stocks with more float than those with a lower float in daily and weekly periods.

Providing a model for gaining excess returns in comparison with market returns In the second phase, designing a strategy to generate additional returns compared to the market index was tested.

In the first scenario, looking at the greater returns of the larger stock market in a day, tomorrow is the day the smaller shares of smaller companies will be bought and maintained, and if the returns of the larger companies are negative and with more losses on the market, Smaller ones will be short sell.

In the second scenario, it is assumed that if small stocks are not held, then we will receive a daily interest rate of 10% risk free annually.

And in the third scenario, observing that if the return on equity is higher on a day than the market is positive, tomorrow the stocks of smaller companies will be maintained, and if the returns of the larger companies are negative and with more losses from the market, the next day the Smaller companies will be short sell and otherwise risk-free returns will be replaced.

Initially, regardless of the transaction costs, the investment strategies will be tested and then, considering the transaction costs, tests will be carried out on the test scenarios.

Thus, without considering the transaction costs, the returns are higher than market index. And it can be said that the difference in the speed of price adjustment can be a way of gaining more return and proving inefficiency in this part of the market.

In order to present a strategy for gaining excess return on the market, three scenarios were designed and tested based on the speed of price adjustment. Results shows that, the returns from stock portfolio formation based on the size, flotation and winner stocks in all three scenarios are significantly more than market yields.

Table 5: Summary of the results of the fifth sub-hypothesis test without transaction costs in three scenarios

Description	Portfolios	The difference in return on the portfolio with the average return on the index
First scenario	Size	The difference is significant
	Floating	meaningless

Fifth sub-hypothesis test results

In the first phase of the design of this strategy, transaction costs are not deducted from the return on the portfolios formation based on speed of adjustment.

- Testing Strategies Without Trading Costs

The result of the designed scenarios shows that the difference in the return of the portfolios formation based on the higher speed of price adjustment of the larger stock, more float and the winners, has a significant difference from smaller stocks, less float, and losers.

	Winner and loser	The difference is significant
The second scenario	Size	The difference is significant
	Floating	The difference is significant
	Winner and loser	The difference is significant
Third scenario	Size	The difference is significant
	Floating	The difference is significant
	Winner and loser	The difference is significant

Table 6: Research innovation and the outcome of each test

Variable name	Agent	Investigator Innovation	Test hypothesis result
Price moderation rate	Stock returns	Creating stock portfolios using the speed of price adjustment and based on market value	More speed of price adjustment of the larger stocks in comparison with the smaller stocks and the observation of the significant difference in the returns generated by this strategy in the larger stocks compared to the smaller stocks
		Creating stock portfolios using the speed of price adjustment and floating rate	More speed of price adjustment of the stocks by more float compared with the stock with less float and the observation of the significant difference in the return on this strategy in the portfolio with more float than those with a lower floatation
		The formation of a portfolio of stocks using the speed of price adjustment and based on the winner or loser	More speed of price adjustment of the winners in comparison with the loser shares and the observation of the significant difference in the return on this strategy in the winning portfolios compared to the losers

• Testing Strategies With Trading costs

In the next step, transaction costs were also included in the quiz. Thus, the use of frequent transactions to achieve minimal yields was controlled and eventually the tests were re-evaluated using a riskfree return rate of 10% and trading costs of 1.5% for each transaction. The results are shown in Table (10).

The result of the designed scenarios shows that the difference in the return of the portfolios formation based on the higher speed of price adjustment of the larger stock, more float and the winners, has a significant difference from smaller stocks, less float, and losers.

Also, the return on the purchase and maintenance floatable. Ultimately, finding a solution to obtain more of stocks based on the speed of price adjustment return on average market returns indicates among larger, winning and more floating stocks has a inefficiencies in this segment of the market. significant difference from the smaller, losing, and less

Thus, even with considering the transaction costs, the returns are higher than market index. And it can be said that the difference in the speed of price adjustment can be a way of gaining more return and proving inefficiency in this part of the market.

In this research, using the speed of stock price adjustment, it has been developing portfolios in different classes of stocks.

In this way, various portfolios were created using the speed of stock price adjustment and size criteria, floatation, and winning or losing. In the end, the results of this study showed that the swiftly adjusted stock price of a larger stocks, with a wider float, and winners has a significant difference in comparison to smaller, less floating and losing stocks.

Table 7: Summary of the results of the fifth hypothesis test with the deduction of transaction costs in three scenarios

Description	Portfolios	The difference in return on the portfolio with the average return on the index
First scenario	Size	The difference is significant

	Floating	meaningless
	Winner and loser	The difference is significant
The second scenario	Size	The difference is significant
	Floating	The difference is significant
	Winner and loser	The difference is significant
Third scenario	Size	The difference is significant
	Floating	The difference is significant
	Winner and loser	The difference is significant

Table 8: Research innovation and the outcome of each test

Variable name	Agent	Investigator Innovation	Test hypothesis result
Price moderation rate	Stock returns	Creating stock portfolios using the speed of price adjustment and based on Market value	The speed of price adjustment of the larger stocks was more in comparison with the smaller shares and the observation of the significant difference in the returns generated by this strategy in the larger stocks compared to the smaller stocks
		Creating stock portfolios using the speed of price adjustment and floating rate	More speed of price adjustment of stock prices with more floatation compared to stocks with less floatation and the observation of the significant difference in returns from this strategy in stock portfolios with more float than those with a lower floatation
		The formation of a portfolio of stocks using the speed of price adjustment and based on the winner or losers	More speed of price adjustment of the winners in comparison with the loser shares and the observation of the significant difference in the return on this strategy in the winner portfolios compared to the losing companies

5. Discussion and Conclusion The evaluation of the speed of stock price adjustment to general information by comparing the

models based on measuring the price reaction to public information has been the main goal of this research. According to the findings of this research, the speed of price adjustment based on the company's specific variables is significant in terms of size, flotation rate, and winner or loser.

The results of the research, especially the results obtained from the Lim model, are carried out along with other research results and are in line with the research background. According to the results, there is a significant difference in the speed of price adjustment of the larger stock price compared to the smaller shares.

Thus, the higher speed of price adjustment of the stock prices of larger companies compared to smaller ones, especially the results of the Lim model, it can be said that this segment of the market _____ are calculated and compared with the return of the market index. The results show that the return of the formation of portfolios based on the mentioned variables and designing the timing of

The results of the tests carried out along with the results of other researches in other markets confirm the existence of a significant difference between speeds of price adjustment of the winning share prices versus the losers.

Considering the higher speed of price adjustment of the winning shares compared to the loser, it can be said that this part of the market is inefficient and there is a possibility of gaining additional returns compared to the market total index.

Further, presenting a model to maximize returns on the average return of the market was found on the agenda by finding the best time period for the transaction, based on price adjustment. Accordingly, the returns of the portfolios formed in different time periods _____ are calculated and compared with the return of the market index. The results show that the return of the formation of portfolios based on the mentioned variables and designing the timing of

transactions based on the reaction speed of prices has a significant difference from the average market return.

Eventually, in order to achieve more realistic and tangible results, transaction costs were also deducted

from the returns generated through the proposed strategy. In this case, the return on the basis of the proposed model is significantly different from the

average return on the market index.

Table 9: Secondary sub hypothesis and aligning it with previous research

Variable name	Agent	Findings of previous research	The result of the second hypothesis test and its alignment with the research background
Market value	Size	Reinhangem (1981), Laconishuk et al. (1994), Ghaemi and Tusi (2006), Poorheidari and Bayat (2010) confirmed the great power of explaining the returns by the size of the company.	There is a significant difference in the speed of adjustment of the stock prices of larger companies in response to publicly released news in the market and the significant difference in the return on portfolios formed based on the speed of price adjustment. The results of the studies are in line with the research background.

Table 10: Testing the third hypothesis and aligning it with previous research

Variable name	Agent	Findings of previous research	The result of the first hypothesis test and its alignment with the research background
Winner or loser	Price changes	George and Hun (2004), Liu et al. (2011) confirm higher returns using this variable compared to other strategies. Shirazi-Pour (2012) confirms the significance of the returns of winning and losing stocks in maintenance periods of 3, 6 and 12 months, and finally, Fallahpour (1392) has a significant positive correlation between 5,20 and 60 days.	There is a significant difference in the speed of price adjustment of the winning stocks in response to publicly released news in the market and a significant difference in returns from the formation of a portfolio base on the speed of price adjustment with the winning criterion. The results of the research are in line with previous research results.

Table 11: Testing the fourth sub-hypothesis and its aligning with previous research

Variable name	Agent	Findings of previous research	The result of the fourth hypothesis test and its alignment with the research background
Stock Float	Change ownership	Jiang (2006) yields higher returns of equity portfolios with lower institutional ownership	There is a significant difference in the speed of stocks price adjustment in companies with more flotation in response to publicly released news in the market and a significant difference in portfolio returns consistent based on the speed of price adjustment with further flotation criteria. The findings of this research show that, unlike previous studies, the speed of stock adjustment with more floatation in Tehran Stock Exchange is lower than that of less floating stocks.

In addition, using the results of these models, it can be concluded that the best time of purchase and

maintenance or the length of the maintenance period based on the proposed strategy is within about 7 business days. Given the evidence of market failure and the difference in the rate of price

adjustment, and given the existence of strategies to achieve higher returns compared to the overall index, it can be said that there is overreaction and underreaction in some of the market sections and inefficiency can be seen in some parts.

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