UMZ

Journal of International Marketing Modeling
Volume 3, Issue 1, pp. 51-61, 2022
Journal homepage: *http://jimm.journals.umz.ac.ir*
ISSN 2717-381X

Faculty of Economics & Administrative Sciences

The Role of Profitability in Estimating Stock Returns by Following a Model of Belief Updating in Iran's capital market

Zahra Kazemi Saraskanrood[a*]
[a]. *PhD Student, Department of Business Administration, Mazandaran University, Babolsar,0 Iran*

Abstract

Analysis of investors' behavior is a new scientific field in financial behavior, which is a good tool for acquiring this knowledge. Uncertain circumstances cause investors to make systematic mistakes and face cognitive biases in their expectations and decision making, including in assessing stock returns. The purpose of this study is to investigate the extent to which investors follow the pattern of belief updating as a cognitive bias in the use of earnings accounting information to evaluate the stock returns of 205 active companies in Tehran Stock Exchange. Multivariate regression analysis was performed using Eviews9 software. The results show that by controlling year and industry effects, investors use profitability for most of the past years in following the pattern of belief updating based on two indicators of reducing realized earnings per share and equity returns. The research model is also confirmed by the sensitivity analysis and controlling company effects based on the equity return index. However, it is not confirmed by the two indicators of realized earnings per share and return on assets.

Keywords: Profitability, Stock Returns, Belief Updating, Tehran Stock Exchange.

1. Introduction

In the context of behavioral economics, the real situation is associated with uncertainty, and therefore, the real behavior is deeply distorted by the assumption of neoclassical "complete certainty". Based on the findings of behavioral economics, in uncertainty, people's decision is more based on rules of thumb than rational prediction. Many researchers believe that not all investors have the same perception of information received and do not respond equally to trends. As a result, their decisions are not always in line with economic theories. Behavioral studies address this problem in a more realistic way (Dadgar, 2017). The results of a study by Barber & Odean (2011) indicate that many investors make systematic (unilateral and biased) investment decisions and do not trade at random. In general, their decision making is based on their feelings and beliefs rather than analysis and rationale. Experimental evidence from other laboratory and field studies indicates that stock prices or returns do not always reflect fundamental values, and individual behavior in predicting price or stock returns based on dividends, called value relevance, is often incompatible with the theory of rational expectations (Witteloostuijn & Muehlfeld, 2008). The phenomenon of belief updating is also one of the debates in behavioral finance. Updating beliefs means that people abandon their old beliefs and use new information. In reality, of course, this is not the case in many cases, and individuals' mental history affect their interpretation of the information ahead (Saeedi & Farhanian, 2015; Hirshleifer, 2011). This effect causes the judging person to be influenced by a desirable trait of the subject or person, and to extend this trait to other traits. Such misconceptions can potentially

* Corresponding author.
E-mail address: Z.Kazemi04@umail.umz.ac.ir (Z. Kazemi Saraskanrood)
Received 23 September 2022; Received in revised form 28 October 2022; Accepted 10 November 2022

lead to mispricing in the stock market. For example, if investors see a favorable outlook for growth stocks and attribute it to a risk-adjusted return outlook, then the price of such stocks may be higher than intrinsic value. Processing information and forming beliefs about future asset returns is an essential aspect of successful financial decisions. Investor's information processing is however often influenced by contexts irrelevant for predicting future returns. For instance, the way investors update their beliefs given new information depends on whether their current investment position reflects a gain or a loss and whether the information they receive is favorable with respect to their investment (Kuhnen and Knutson, 2011, Kuhnen, 2015, Rotaru et al., 2021, Trutmann et al., 2022). Such context-dependent belief updating processes can have a detrimental impact on investor's decisions and profits (Grosshans et al., 2020). At first glance, it appears natural to assume that people's belief updating will profit from receiving information instantly. Likewise it should be beneficial to respond immediately to new information. However, piece-wise and instantaneous information processing might lead to less deliberated decisions (Imas et al., 2022).

Numerous studies have attempted to identify the determinants of investor decision making. These studies examined various factors such as risk taking and overconfidence (Mudzingiri et al., 2018), investor emotional orientation (Frydman, 2020, Bossaerts, 2019, Frijns et al., 2017 and Liston, 2016), and collective behavior (Zhang & Zheng, 2016) to understand how decisions are made by investors. A review of the literature shows that studies have paid little attention to belief updating in the study of value relevance. Although the theory of belief updating was initially based on explaining individual and group decisions, Fennema and Koonce (2010) believe that the mechanisms of this theory can be applied to both intra-organizational and inter-organizational users of financial statements. Their argument is based on two factors; the first is that corporate stock valuation is not commensurate with accounting standards and practices. When there are different procedures and ways to process events and financial information, the tendency is to use belief updating. Gerhard et al. (2017) consider belief updating as a basis for mere stock riddle and have shown that belief updating has contributed to an excessive increase in stock prices in the 1990s. This is because investors with higher earnings in recent years take more risk and over-sensitivity to losses are combined with a greater willingness to invest in stocks. The second factor is that many accounting information is able to facilitate the process of belief updating for both producers and users of financial statements. For example, this process is performed for financial statement providers by separating the expected earnings components in the explanatory notes and for investors by assessing convertible securities (Fennema and Koonce, 2010).

The main purpose of this study is to answer the question of whether investors in Tehran stock exchange use profitability in most years (relative profitability status of firm against profitability in most previous years) in following the pattern of belief updating. In Iran, several studies have already investigated the behavioral finance issues using questionnaire tools (Heidari Far and Keyghobadi, 2018; Eskini and Aghajani, 2018; Bineshyan and Dehdar, 2018). However, the present study has made an attempt for the first time to test one of the most controversial topics - belief updating – through designing a mathematical model and using novel econometric approaches. Keeping track of how decisions are made and variables affecting decision-making of people active in the money and financial markets and, in particular, stock market, has always been a challenging issue for policymakers. Knowing the way, method and behavior of the activists of this field in selecting the best stocks will have several benefits, such as the efficient management of the capital market by public sector policymakers with timely and correct behaviors, preventing anomalies and creating an irrational price bubble. All these benefits would ultimately benefit all investors in this market and would encourage individuals to enter the market; through which the stock companies would take appropriate action and prevent market disruption. The present study adds to behavioral finance and accounting literature and helps researchers and scholars interested in these fields to gain a better understanding and more accurate assessment of the country's capital market through university studies. Subsequently, Tehran stock exchange can benefit from these precise results. In this study, the research hypothesis is first formed by studying the theoretical foundations and background of the research. In the following, the research method and research hypothesis testing will be reviewed. Finally, the conclusions of the research findings will be presented.

2. Literature Review

2-1. Value Relevance

It has long been claimed that accounting information contained in financial statements is one of the important sources of information for investors and other participants in the capital market. Therefore, it can be reasonably expected that items, such as accounting profit and book value, play an effective role in the valuation of equity (Aleksanyan, 2007). The results of the study by Dobija and Klimczak (2007) have also shown that net profit is one of the most important financial information presented in the event of profit and loss and is the basis used to evaluate firm performance and value determination. If investors keep in mind the profitability of the company and attribute it to the company's outlook, the current year's profitability will be underestimated. Therefore, it can be argued that investors are affected by the reported relative profit status of the company. Value relevance is defined as the statistical relationship between accounting information and price or return on stocks (Francis & Schipper per, 1999). Such an interpretation requires the measurement of value relevance on the basis of "acquired news". In other words, accepting such an interpretation implies that the reason for the price change or return of stocks when entering relevant information is to force investors to revise their initial expectations. However, operationalizing the latter interpretation requires the simultaneous consideration of two interlinked concepts of "timeliness" and "expectations formation". To better understand this, suppose a situation where the price or return on stock of a company does not change much when declaring profit. The reason for such an event is that either the reported earnings are unrelated or impaired or that the earnings are already predicted by investors and almost completely reflected in their expectations and stock price. The limited and final case of the present example illustrates a situation in which the company's profit is fully predictable, such that the company's profit announcement will have no effect on its price or return on stock. Multiple linear regression (usually including book value and returns on stock as independent variables and stock market value as dependent variables) to measure the value relevance of profit. Also, time series analyses and coefficient of determination are used to determine the level of statistical significance and the trend of value relevance changes. The decrease in the correlation between accounting information and market price (or the decrease of coefficients of determination) over time is considered to be the decrease in the value relevance. Clearly, the value relevance of profit is its ability to confirm or change investors' expectations of the value of the company. If the company's shares are traded among investors, the market price of those shares should summarize the investors' general expectations of value. Therefore, the value relevance of profit can be measured by the reaction to market prices when accounting figures are published. This is not to imply that stock valuation is the sole purpose of financial statements, but as noted by Barth et al. (2001), the main focus of institutions monitoring capital market and standard makers is on stock investors. In this way, the profit value relevance model can be presented as follows:

$$RET_{i,t} = \beta_0 + \beta_1 PROF_{i,t} + \varepsilon_{i,t} \quad (1)$$

where in :

$RET_{i,t}$ = Stock Returns of company i in year t.

$PROF_{i,t}$ = Profitability of company i in year t, which can be measured using various criteria.

2-2. Belief Updating

Investors' belief-updating is often influenced by factors such as the current investment position and whether information is subjectively favorable. Such motivated beliefs can lead to profit harming decisions (Trutmann et al., 2022). Conservatism bias (lack of belief updating) leads to a low reaction to published information. This bias runs counter to the intuition of agency that leads to overreaction. This is why investors have the potential to be more reactive and less reactive at the same time. If the published information is related to one of the classes and the investors feel it is appropriate for some reason, agency intuition will occur and they will be more responsive. When recent information is not appropriate, the conservatism bias will be presented and little reaction will occur. Suppose a company declared predicted earnings per share of 70 Tomans at the beginning of the fiscal year. A news release comes out in August that the termination of one of the contracts will reduce the company's sales and profits. The conservatism bias slows down the decision making adjustment based on the latest information and makes the same profit per share of 70 Tomans as the decision criterion. As a result, the conservatism bias

(lack of belief updating) in investors causes them not to react quickly to new information and thus, to lag behind the market. Obviously, such behavior causes losses and on the other hand, the loss of profitable opportunities (Saeedi & Farhanian, 2011). Social psychologists have studied how and when people update their early beliefs. Unlike economists, psychologists do not necessarily assume that individuals update their beliefs in a rational way. In fact, research in social psychology suggests a number of systematic aberrations in updating beliefs. People generally try to interpret inequality with rational reasoning or to correct their attitudes. As such, the emergence of such an approach at the capital market level leads to an irrational behavior towards the desirable or undesirable valuation of corporate stocks and consequently, antithetical changes to financial-standard theory. According to the literature on the belief updating phenomenon, individuals remain consistent with their original beliefs and measure new information based on their past information, which can weaken the effect of new information. Therefore, accounting information provided by companies, including profit information, as the most important source of information for investors to make investment decisions, can play an important role in realizing the phenomenon of belief updating in the capital market (Boubakri, 2012). The hypothesized underlying mechanism motivating our intervention is that cognitive distance to a prior decision helps mitigate the effects of the context in belief formation such as motivated beliefs, regret aversion and cognitive dissonance. When people immediately receive information affecting their profits, they may update their beliefs very subjectively (e.g. expecting the value of an investment to return to the initial buying value, Trutmann et al., 2022). In contrast, delayed information provision and restricted decision-making opportunities separate the information processing and the decision. Delaying information therefore provides time to process new information thoroughly and may have similar positive effects as a dedicated waiting period (Imas et al., 2022). Consequently, these changes to the decision environment might reduce the involvement of an investor with their prior decisions. This in turn can improve belief updating and thereby also subsequent decisions. Based on these assumptions we predict that, first, delayed information provision and restricted decision-making opportunities brings people's beliefs closer to a Bayesian belief which serves as our rational benchmark. Second, such improved beliefs might translate into to more profitable subsequent investment decisions.

2-3. The Role of Belief Updating in Using Profitability Reduction in Assessing Stock Returns

Boda and Sunitha (2018) and Kinsler (2018) have studied the psychological challenges and consequences of cognitive biases on investor decision making. Mudzingiri et al. (2018) showed that risk-taking, overconfidence, and conservatism are significantly correlated with the level of investor financial literacy at the time of decision making. Frijns (2017) concluded that return on stock is mainly due to the emotional tendency of investors. Gerhard et al. (2017) carried out a study entitled "Past Performance Framework and Investor Belief Updating" and examined whether long-run returns are always accompanied by belief updating and providing average return earnings information of past years affect investor belief updating. In their in vitro and online experiments, they exposed individuals to average earnings data from previous years and measured their beliefs. The results of this study showed that previous earnings information with longer horizons are related to belief updating as a default. The results of Liston's (2016) study on modern behavioral finance showed that investors' individual emotions have a significant impact on the market and stock prices. Dhaoui and Nacer (2014) examined the impact of investors' optimistic and pessimistic beliefs on the trend and volume of trading in the stock market. The results of this study, which is based on evidence from the French stock market between 2005 and 2011, showed that the trend and volume of trading in the French stock market is highly sensitive to investor beliefs and tendencies. In general, the trend and intensity of transactions are more sensitive to pessimistic sentiment. Jamshidi and Ghalibaf Asl (2018) showed that different personality traits of investors affect different components of trading behavior and subsequently, their investment performance.

A review of research literature, including the studies of Gerhard et al. (2017), Hoffmann and Post (2017), and Dhaoui and Nacer (2014), shows that with regards to the phenomenon of belief updating, individuals persist on their basic beliefs and measure new information based on their past information, which can undermine the effect of new information. For example, if investors remember the company's profitability history and attribute it to the company's outlook, they may ignore current year's profitability decline. Therefore, it can be argued that investors

will judge and evaluate the current year's profit or loss figure based on the relative profit status of the company against profitability for most of the past years. As such, it seems reasonable to test the moderating effect of the relative profitability of a firm against the foregoing on the value relevance of profit reduction to test the effect of belief updating. Accordingly, the research hypothesis can be expressed as follows:

- Investors in Tehran stock exchange use profitability for most of the past years to evaluate stock returns in following the pattern of belief updating.

3. Methodology

The target population of this study is all listed company in Tehran Stock Exchange for a period of ten years from 2011 to 2020. The research sample was selected by systematic elimination sampling method. The total number of companies listed in the Tehran Stock Exchange as of the end of 2020 is 730 companies, among which there are selected companies with special requirements.. For this purpose, the fiscal year of the companies should end by March and should not be excluded from the list of companies listed in Tehran Stock Exchange during the period under consideration. The required information of each company should be available over the study period. Also, they should not be among investment firms, banks and monetary and credit institutions. Finally, these companies must have been accepted in Tehran Stock Exchange before 2011. Accordingly, 79 companies were eliminated as the end of the fiscal year is in March, 37 companied were eliminated due to changes in financial period, 303 companies were eliminated due to unavailability of financial information, and 106 companies were eliminated because of their activity in the financial and banking industry and investment. Thus, 525 companies were eliminated in total. After applying the constraints, the remaining 205 companies were considered for collecting and analyzing the research data.

As mentioned, three categories of independent, dependent and moderating variables were used to adjust the conceptual model of the research. In this study, the decrease in firm profitability was considered as an independent variable, the effect of belief updating as a moderating variable, and stock returns as a dependent variable.

The following equation is used to measure stock returns:

$$\frac{\textit{Cash Benefits - Privilege Stock Benefits + Advantages of Priority Right + Gross Cash Profit Per Share + Share Price Difference}}{\textit{Stock prices at the end (beginning) of the fiscal year}} \quad (2)$$

According to the theoretical foundation on value relevance of profit, company profitability reduction is expected to have a significant and inverse relationship with stock returns. It can be calculated in three ways:

•Decrease in realized earnings per share of company i in year t compared to year t-1; if this variable is reduced, it would be equal to the net decrease figure, otherwise equal to zero.

•Decrease in return on assets of company i in year t compared to year t-1 would be equal to the ratio of net profit to assets in year t minus the ratio of net profit to assets in year t-1; if this variable is reduced, it would be equal to the net decrease figure, otherwise equal to zero.

•Decrease in equity returns of company i in year t compared to year t-1 is equal to net profit to equity ratio in year t minus net profit to equity ratio in year t-1; if this variable is reduced, it would be equal to the net decrease figure, otherwise equal to zero.

In order to measure profitability for most of the past years, this variable is equal to one if the company has been profitable for three years over the past five years, otherwise equal to zero.

The financial statements and notes of the companies listed on the Tehran Stock Exchange for a ten-year period from 2011 to 2020 were reviewed. The information needed to formulate the theoretical foundation and background of the research was gathered through library studies and research data have been collected using field method. The necessary data were collected by viewing the financial statements and accompanying notes on the Stock Exchange website, the Codal site, and Tadbir Pardaz software.

The research hypothesis is tested using Gerhard et al.'s (2017) study framework:

$$RET_{i,t} = \beta_0 + \beta_1 DEC\_PROF_{i,t} + \beta_2 MOP_{i,t} + \beta_3 DEC\_PROF*M0P_{i,t} + \varepsilon_{i,t} \quad (3)$$

It is worth noting that in the above equation, RET is Stock Returns of company, DEC_PROF is profitability decline, MOP is profitability for most of the past years,

The variable of ($DEC\_PROF*M0P_{i,t}$) indicates the effect of the belief updating phenomenon, and the indices i and t represent company and year, respectively. In order to confirm belief updating phenomenon, β1 is expected to be smaller than zero and significant, β2 greater than zero and significant, and β3 smaller than zero and significant. Generalized least squares method was used to estimate the regression equations in order to eliminate the heterogeneity between the model equation errors. The estimation of the hypotheses testing model was performed using Eviews 9 statistical software.

4. Findings

Table 1 presents the descriptive analysis of variables, including mean and standard deviation, and also Pearson's correlation coefficient for checking the default non-linearity of variables.

Table 1. Descriptive analysis of research variables

Variables	Sign	Mean	SD	1	2	3	4	5
1. Stock return	$RET_{i,t}$	0.702	8.39	1				
2. Decreased earnings per realized share	$DEC\_PROF_{i,t}1$	-302	24.11	-0.014	1			
3. Decreased return on assets	$DEC\_PROF_{i,t}2$	-0.23	5.37	0.034	0.01	1		
4. Decreased return on equity	$DEC\_PROF_{i,t}3$	-1.356	19.24	0.025	-0.01	0.41*	1	
5. Profitability in most previous years	$MOP_{i,t}$	-	0.261	-0.069	-0.03	-0.014	-0.022	1

* and ** imply significance at the 5% and 10% levels, respectively.

According to the results of Table 1, there was no correlation greater than 0.8 between any of the variables, indicating lack of co-linearity among research variables.

The normality of the residuals of the regression model is one of the regression assumptions that shows the validity of the regression tests. Due to the limitations of Kolmogorov-Smirnov test in hybrid regression models, the normality of the distribution of research variables was investigated using the Jarque-Bera test. Table 2 shows the results obtained for the normality of the dependent variable.

Table 2. Jarque-Bera test results

Variable	Jarque-Bera statistics	Sig. level
Stock returns	5E+05	0.000

According to the results in Table 2, because the significance level is less than 0.05, the distribution of the dependent variable is not normal. It should be noted that when the sample size is large enough, the deviation from the assumption of normality and its consequences is usually negligible. Given the central limit theorem, it can be seen that even in the absence of normality, the test statistics will asymptotically follow appropriate distributions. Therefore, the lack of justification of this hypothesis is negligible.

Results of testing of model (2) to test the research hypothesis by controlling the effects of year and industry using the estimated generalized least squares (EGLS) method are presented in Table 3.

Table 3. Results of the research question by controlling year and industry impact

$RET_{i,t} = \beta_0 + \beta_1 DEC\_PROF_{i,t} + \beta_2 MOP_{i,t} + \beta_3 DEC\_PROF*MOP_{i,t} + \varepsilon_{i,t}$

Variables	observations	Based on earnings on per realized share	Based on return on assets	Based on return on equity
Fixed	1230	0.71** (2.85)	0.56 (1.62)	0.56 (0.702)
$DEC\_PROF_{i,t}1$	1230	-0.0007** (-4.085)	-	-
$DEC\_PROF_{i,t}2$	1230	-	-0.2 (-1.102)	-
$DEC\_PROF_{i,t}3$	1230	-	-	-0.48** (-10.79)
$MOP_{i,t}$	1230	0.13** (3.49)	0.02 (0.071)	0.13** (6.169)
The phenomenon of updating beliefs 1	1230	-0.0007** (-4.054)	-	-
The phenomenon of updating beliefs 2	1230	-	-0.19 (-1.147)	-
The phenomenon of updating beliefs 3	1230	-	-	-0.46** (-9.087)
Year effect		Controlled	Controlled	Controlled
Industry effect		Controlled	Controlled	Controlled
F-statistics		1.83	2.17	6.25
F-statistics probability		0.03	0.008	0.000
Coefficient of determination		0.32	0.32	0.307
Adj coefficient of determination		0.31	0.31	0.36
Durbin-Watson statistics		1.97	2.01	2.07

* and ** are significant at 5% and 1%, respectively. (Terms in parentheses indicate t-student statistics).

The results of Table 3 show that the variables of decreasing quarterly earnings, decreasing equity returns, profitability for most of the past years, and the phenomenon of belief updating have a significant and negative impact on Stock return. Statistical value and significance level of F indicate significance of test models. Durbin-Watson is also in the range of 1.5-2.5, meaning that there is no autocorrelation problem Thus the research hypothesis based on " Investors in Tehran stock exchange use profitability for most of the past years to evaluate stock returns in following the pattern of belief updating " comfirmed. Based on the framework of Gerhard et al. (2017), it is confirmed by the results of model (3). Another notable point in Table 3 is the adjusted coefficient of determination of the model. The coefficient of determination of the model is between 0.31 and 0.36%, which indicates that about 0.31 to 0.36% of the dependent variable can be explained by the independent variables. The coefficient of determination is low due to the high number of firms (205 companies) and the short period of the study (5 years).

In this study, the research hypothesis was examined by controlling the effects of the company (without considering the effects of year and industry).

In order to estimate model (3) coefficients in the sensitivity analysis method, In order to estimate the coefficients of the research models, Chow test and F-Limer statistics were used to determine the combination data method and to detect their homogeneity or heterogeneity. The necessity of using fixed or random effects method has also been investigated by applying the Hausman test. Table 3 shows the results obtained for the Chow and Hausman test.

Table 4. Chow and Hausman test results

Index	Chow test		Hausman test	
	F-statistics	*P*-value	Chi-square statistics	*P*-value
$DEC\_PROF_{i,t}1$	1.78	0.000	2.72	0.25
$DEC\_PROF_{i,t}2$	1.54	0.000	38.1	0.06
$DEC\_PROF_{i,t}3$	1.42	0.000	6.46	0.13

As can be seen in Table 4, the Chow test results show that the probability obtained for the F statistic is less than 5%, so the data are used as a panel to test the models. According to Table 3, the level of significance of the Hausman test for all indices is less than 0.05, so the fixed effects model should be used to estimate the coefficients of the model.

Table 5. Results of model testing with sensitivity analysis

$RET_{i,t} = \beta_0 + \beta_1\ DEC\_PROF_{i,t} + \beta_2\ MOP_{i,t} + \beta_3\ DEC\_PROF*MOP_{i,t} + \varepsilon_{i,t}$

Variables	observations	Based on earnings on per realized share	Based on return on assets	Based on return on equity
Fixed	1230	-0.06 (-0.055)	0.17 (0.161)	0.05* (2.126)
$DEC\_PROF_{i,t}1$	1230	-2.38E-05 (-0.010)	-	-
$DEC\_PROF_{i,t}2$	1230	-	-0.19 (-0.381)	-
$DEC\_PROF_{i,t}3$	1230	-	-	-0.43** (-3.176)
$MOP_{i,t}$	1230	0.83 (0.651)	0.91 (0.799)	0.59** (2.928)
The phenomenon of updating beliefs 1	1230	-5.15E05 (-0.022)	-	-
The phenomenon of updating beliefs 2	1230	-	-0.111 (-0.221)	-
The phenomenon of updating beliefs 3	1230	-	-	-0.35** (-2.669)
F-statistics		0.15	1.09	13.36
F-statistics probability		0.92	0.35	0.000
Coefficient of determination		0.44	0.46	0.67
Adjusted coefficient of determination		0.42	0.44	0.64
Durbin-Watson statistics		1.75	1.71	1.71

* and ** are significant at 5% and 1%, respectively. (Terms in parentheses indicate t-student statistics).

Table 5 shows the results obtained for model (3) evaluation using the sensitivity analysis method.

The results of Table 5 show that in Model (3), the decrease in firm profitability with the realized quarterly profit, the return on assets, the return on equity criterias are considered as an independent variable, the effect of beliefs updating is considered as a moderating variable and Stock return are considered as dependent variables. The results show that the effect of belief updating phenomenon based on equity return index on stock returns is significant. As such, the model of the research hypothesis is confirmed based on the equity return index according to the Gerhard et al. (2017) study framework and the results of model (3). However, it is not supported by the other two indices. Statistical value and significance level of F indicate significance of test models. Durbin-Watson is also in the range of 1.5-2.5, meaning that there is no autocorrelation problem; The adjusted coefficient of determination at the level of total firms under study is 0.64, meaning that 64% of the dependent variable changes are explained by independent variables.

5. Discussion and Conclusion

The major goal of investors in investing in stock markets is to obtain reasonable returns, which is obtained from two parts of stock price changes and dividend. Investors and financial analysts can predict stock prices and stock returns using investment models. Traditional financial theory states that stock prices represent the fundamental value of stocks and reflect the value of future cash flows. From an efficient market hypothesis perspective, the value of securities reflects all the information available in the market, and the impact of any new information in the market is expected to be reflected immediately in corporate stock prices. On the basis of this theory, investors have a rational attitude, seeking to maximize their expected utility. Accordingly, stock price changes are related to systematic changes in the firm's core values and the investor's irrational behavior has no effect on returns. However, there is a positive relationship between investors' emotional tendencies, including belief updating, with returns on stock that are of higher subjective valuations. Consequently, the behavioral conditions of stock market participants should be examined on the basis of emotional variables. In other words, besides the fundamental factors, the influence of the behavioral and emotional factors of the investors on the stock price should be taken into consideration. Besides the impact of accounting variables, such as return on assets, returns on sales, book value of assets to their market value, earnings per share, firm size, and stock returns, micro and macro behavioral variables also affect stock price. In traditional financial theory, investor sentiment has no role in stock prices, realized returns, and expected returns. However, a behavioral financial perspective shows that investors are influenced by their emotional tendencies, including belief updating, in making decisions. Rational arbitrators will not try hard to return prices to the fundamental level due to the high risk and pricing will not be corrected. Emotional orientation, therefore, plays an important role in determining prices and explaining returns. The results of the hypothesis test of this study showed that investors in Tehran's firm follow the pattern of beliefs updating phenomenon to evaluate stock returns on profitability for most of the past years. Accounting profit and related components are information that is considered by individuals when making decisions. Investors can predict the future price and return of their stocks using financial information and accounting profit and find the best combination for their investment portfolio. Therefore, investors and shareholders need to consider profit information so that they can meet their expectations of the investment by making more accurate and objective decisions. Profit volatility is seen as an important measure of a company's overall risk, and companies that have been profitable for most of the past few years have less risk. Therefore, such companies are the focus of investors and they consider them a better place to invest. In other words, in companies with lower earnings volatility, investors can obtain more useful and relevant information from their published reports for their decision making, and information on the stock prices of these companies is published more quickly. Therefore, it can be argued that investors will judge and evaluate the current year's profit or loss figure based on the relative profit status of the company against profitability for most of the past years. Thus, it can be said that the pattern of belief updating plays a moderating role in the impact of earnings fluctuations on stock returns. The results are consistent with the results of some foreign and some domestic research. In line with the results of this study, Huffmann and Post (2016) showed that investors' past beliefs about past returns influence the fluctuation of risk and expected returns. Also, the results of this study are in line with the results of Gerhard et al. (2017), Mudzingiri et al. (2018), Frijns et al. (2017), Liston (2016), Dhaoui and Nacer (2014) and Jamshidi and Ghalibaf Asl . (2018).

The present study sought to find an answer to the question: "Is the phenomenon of belief updating in Tehran stock exchange useful using accounting profit information and can we provide a model in this regard?" There were three variables in this study, namely profitability and return on stock that formed the concept of value relevance, and the phenomenon of belief updating. In explaining the relationship between these concepts, it can be stated that profit information will be able to show the existence or absence of belief updating as well as the extent to which this phenomenon is used at the capital market level. Multiple linear regression (including stock returns as independent variable and stock market value as dependent variable) was used to measure earnings value relevance. The results of the present study showed that the phenomenon of belief updating is used in stock exchange companies using accounting information and that investors in Tehran stock exchange use profitability in most past years in following the pattern of belief updating. Also, a model can be provided in this regard.

For practical research suggestions, investors are recommended to pay more attention to their emotional behavior and beliefs about the selected stocks, in addition to accounting information, when investing. It is suggested to improve the information structure by providing an appropriate framework for fast, accurate and correct informing regarding the impact of corporate information quality on investor belief and behavior updating. It is also suggested to identify channels of news and rumors that are effective in belief updating, such as websites. The Tehran Stock Exchange should also allow analysts reduce the risk of harm to people affected by cognitive biases, such as belief updating. Professional and non-professional shareholders should be separated to reduce market risk. Short-term investors should also be separated from those with long-term horizons. Providing training on the principles and techniques of investing to potential and actual investors and developing shareholder decision-making knowledge (given the weakness of investors' financial analysis) are also suggested. With regard to investors' follow of the pattern of belief updating, investors should be more careful in buying and selling stocks when there is a passing emotional news in the market.

Future research is also suggested to address the effect of behavioral factors and investors' emotional decisions on the stock price changes of listed companies in Tehran Stock Exchange using different methods of measuring investors' emotional behavior (except for the present research method), including qualitative methods, such as phenomenology and grounded theory, and compare results with the results of the present study. It is also suggested to simulate the rational behavior of investors with variable parameters similar to the parameters of the time periods studied in this study and to evaluate the deviation from the real behavior of investors in these intervals. The effect of profit stability on belief updating and effect of other qualitative variables, such as management experience with other quantitative variables, such as company life, earnings forecast period, stock exchange volume, etc. on belief updating among investors can be investigated for a longer period of time to compare with the results of this study. Future studies can examine the effect of other behavioral financial factors, such as overconfidence, on stock prices and replicate the same for longer periods. Finally, future research can examine the effects of emotional tendencies for periods of less than one year on a daily, weekly, or monthly basis and compare with the results of this study.

The present study has had some limitations. Including that the data derived from the financial statements have not been adjusted for inflation. The timeframe of this study is 2011 to 2020, so caution should be exercised when generalizing the results to the periods before and after the mentioned timeframe. Due to the use of systematic elimination method for statistical sample selection, some industries have been removed from the statistical sample. Therefore, generalizing the results to other industries should be done with caution. Companies' financial statements items often require adjustments in terms of the auditor's reporting requirement clauses and restated items. These adjustments were not considered in this study, therefore, if adjusted, different results may be obtained.

References

Ahmed wafi, S. & Hassan, A. (2015). Fundamental Analysis Models in Financial Markets – Review Study, *Procedia Economics and Finance* , 8(30),939-947

Aleksanyan, M. (2007). Does the Information Environment Affect the Value Relevance of Financial Data? , *Applied Economics Letters, Forthcoming* [online] http://www.ssrn.com/abstract=1022102.

Barber, B.M. & Odean, T. (2011). *The Behavior of Individual Investors*. chapter 28,1535- 1565

Barth, M.E., Beaver, W.H. & Landsman, W.R. (2001). The Relevance of the Value Relevance Literature for Financial Accounting Standard Setting: Another View, *Journal of Accounting and Economics*, 31(1-3),77-104.

Boda, J. R & Sunitha, G. (2018). Investor's Psychology in Investment Decision Making: A Behavioral Finance Approach, *International Journal of Pure and Applied Mathematics*, 119(7),1253-1261

Boubakri, F. (2012). The Relation between Accruals Quality, Earning Persistance and Accruals Anomaly, *Journal of Economics and Finance*, 4(6),51-62.

Bossaerts, P., Suzuki, S. & O'Doherty, J. P. (2019). Perception of intentionality in investor attitudes towards financial risks. *Journal of Behavioral and Experimental Finance*. 23, 189–197

Cuong, P.K. & Jian, Z. (2014). Factors Influencing Individual Investors' Behavior: An Empirical Study of the Vietnamese Stock Market, *American Journal of Business and Management*, 3(2), 77-94

Dadgar, Y. (2017). Behavioral Economics Patterns and Judicial Approach Reform Capacity, *Comparative Economy Journal*, 4(1), 69–88.

Dhaoui, A.B. & Nacer, K.H. (2014). Sensitivity of Trading Intensity to Optimistic and Pessimistic Beliefs. *Arab Economics and Business Journal*, 9(1),115-132

Dobija, D., & Klimczak, K.M. (2007). Value Relevance and the Development of Accounting Regulation and Market Institutions in a Transition Economy: Case of Poland, Kozminski Business School, Warsaw, Poland. [online] http://www.ssrn.com/abstract=1084423.

Fennema, M. & Koonce, L. (2010). Mental Accounting in Financial Reporting and Voluntary Disclosure. [online] http://dx.doi.org/10.2139/ssrn.1717078

Francis, J., & Schipper, K. (1999). Have Financial Statements Lost their Relevance?', Journal of Accounting Research, 37(2), 319-352.

Frijns, B., Willem F.C., Verschoor, R. & Zwinkels, C.J. (2017). Excess stock return comovements and the role of investor sentiment, *Journal of International Financial Markets, Institutions & Money*, 49(3),74-87

Frydman, C. & Wang, B. (2020). The impact of salience on investor behavior: Evidence from a natural experiment. *The Journal of Finance*. 75, 229–276

Gerhard, P., Hoffmann, A. and Post, T. (2017) 'Past performance framing and investors' belief updating: Is seeing long-term returns always associated with smaller belief updates?, *Journal of Behavioral and Experimental Finance*, 15(9),38-51

Grosshans D., Langnickel F. & Zeisberger S. (2020), Is buying more forward-looking than selling? The role of beliefs in investment decisions, J. *Behav. Exp. Finance*, 14, 82-92

Hirshleifer, D. (2001). Investor Psychology and Asset Pricing, *Journal of Finance*, 56(4), 1533-1597.

Hoffmann, A.O. & Post, T. (2017). How return and risk experiences shape investor beliefs and preferences, *Accounting & Finance. Forthcoming issue. Accounting & Finance*, 57(3), 759-788

Imas A., Kuhn M.A., Mironova V. (2022). Waiting to choose: The role of deliberation in intertemporal choice, *American Economic Association Journal*, 14 (3), 414-440

Jamshidi, N. & Ghalibaf asl, H. (2018). Studying the Effect of Investors' Personality on their Business Behavior and Investment Performance: Evidences of Tehran Stock Exchange, *Financial Research Journal*, 20(1), 75–90

Kienzler, M. (2018). Value-based pricing and cognitive biases: An overview for business markets, *Industrial Marketing Management*, 68(1), 86-94

Kuhnen C.M. (2015). Asymmetric learning from financial information, *Finance Journal*, 70 (5), 2029-2062.

Kuhnen C.M., Knutson B. (2011). The influence of affect on beliefs, preferences, and financial decisions, *Journal of Financial and Quantitative Analysis.*, 46 (3), 605-626.

Liston, D. (2016). Sin stock returns and investor sentiment, *The Quarterly Review of Economics and Finance*, 59, 63-70

Mudzingiri, C., Muteba Mwamba, J.W. & Keyser, N. (2018). Financial behavior, confidence, risk preferences and financial literacy of university students, *Cogent Economics & Finance*, 6: 1512366. DOI: 10.1080/23322039.2018.1512366

Rotaru K., Kalev P.S., Yadav N., & Bossaerts P. (2021). Transferring cognitive talent across domains: The case of finance, *Scientific Reports*, 11, 23068 (2021). https://doi.org/10.1038/s41598-021-02596-2

Saeedi, A. & Farhanian, M.J. (2015). *Fundamentals of Behavioral Economics and Financial Behavior*, 2nd ed., Bourse Publications, Tehran.

Tekçe, B. & Yilmaz, N. (2015). Are individual stock investors overconfident? Evidence from an emerging market, *Journal of Behavioral and Experimental Finance*, 5, 35-45.

Trutmann, K., Heinke, S., & Rieskamp, J. (2022). Belief Updating and Investment Decisions: The Impact of Good or Bad News Varies With Prior Returns (September 13, 2022). Available at SSRN: https://ssrn.com/abstract=3935798 or http://dx.doi.org/10.2139/ssrn.3935798

Witteloostuijn, A. & Muehlfeld, K. (2008). Trader personality and trading performance, *Tjalling C. Koopmans Research Institute Discussion Paper Series* , 8(28),1-44.

Zhang, Yu. & Zheng, X. (2016). A Study of Herd Behavior Based on the Chinese Stock Market, *Journal of Applied Management and Investments*, 5(2), 131-135.