

**Review Article**

**THE IMPACT OF MANAGERS EXPECTATIONS STICKINESS ON FUTURE STOCK RETURNS**

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Accepted: 09.02.2020

Revised: 14.01.2020

Received: 10.12.2019

**Abstract**

Predicting stock returns and securities pricing has always been one of the most important issues for financial marketers. The information provided by managers in corporate financial statements helps investors make optimal decisions, the value of this information depends on their accuracy, the biases of managers misrepresent the information, and cause inaccurate forecasts and thus decision making. It goes wrong. Choosing to invest regardless of managers' bias leads to wasted resources and incorrect decision making. The purpose of the present study is to study the impact of managers' expectations on the stock returns. In this study, stock returns were calculated using Fama and French three-factor model. Research hypotheses were tested using data from 178 companies over a 7-year period from 2011 to 2018 using multivariate regression and combined data. According to the results of the statistical analysis, there is a significant relationship between the expectations of managers and the stock return at 95% confidence level.

**Key Words:** managers' expectations stickiness, profit forecasting error, forecast revision, Fama and French three-factor model.

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**INTRODUCTION**

The importance of investment and the stability of the investment environment for economic development and growth are evident, and neglecting its importance can lead to economic decline and affect public welfare and production development in the long run (Hadian, Hashemi and Samadi, 2017). Accounting is an information system and it must provide users with efficient, accurate and timely information so that they can use this information as a basis for their decision making (Hussein Zadeh and Ahmadi Nia, 2009).

Stock returns is one of the most important factors in choosing the best investment. The return on an investment reflects the benefits of that investment, and the investors look for investment opportunities that increase their return on capital. Prediction of the expected returns is important for many financial decisions, such as capital cost estimation, portfolio management, capital budgeting, and performance appraisal (Rowl and Pasaribu, 2010).

It is important for investors to determine the rate of return. Initially, determining the rate of return on equity was introduced as the classical finance. Based on Miller and Modigliani arbitrage principles, the foundations of Markowitz theory, Sharp, Linter and Black's theory of pricing the capital assets, Black, Schulz and Merton's option pricing theory attracted academic scholars' attention. Classic finance is based on assumptions or ideal sets such as the assumption of perfectly rational behavior and the utilitarian interest of investors, but the passage of time and observation of some market anomalies have brought behavioral and psychological issues into the domain of finance and the formation of behavioral financial knowledge (Shams al-Dini, Daneshi, and Seyedi, 2018).

Unlike classical financial knowledge, the behavioral financial knowledge is based on realistic assumptions such as irrational behavior and limited benefits. On the other hand, due to the classical financial inability to explain the observed abnormalities in the capital market, the study and research on the behavioral and psychological issues of investors has become particularly important; experts in this field believe that such anomalies in the capital market are emerged mainly

due to the investors' behavioral and psychological factors. In other words, different investor behaviors can somehow affect market performance and its efficiency, and thus have a significant impact on the stock returns. On the other hand, not only does the investor influence stock returns, but his management behavior and behavioral patterns are also expected to affect stock return.

Accounting information and accuracy of information presented in predicting future stock returns is very important for investors. Considering the aforementioned, it can be said that besides accounting variables that are effective in predicting future stock returns, the behavioral variables are also very influential on the made predictions. So in this research the relationship between one of the cognitive variables namely the adherence of the managers' expectations and the future returns of the stock has been evaluated; on the other hand, considering that some managerial mechanisms such as corporate governance mechanisms that partially capture the previous biases and viewpoints of managers provide transparent and high quality information, and prevent resource depletion, such issues have been studied as an intervening variable to investigate its role and impact on the relationship between these two variables.

**THEORETICAL FOUNDATIONS**

**-Stickiness of managers' expectations**

One of the tools for corporate managers to interact with the market is to provide information on predicting the profit of the company based on which companies can influence market behavior. According to the psychological theories, managers' behavior is influenced by some personality traits (Safari Gerayeli, Rezai Pite-Noi, 2017). The benefits predicted by managers are important in evaluating companies and influencing the stock prices of companies. Therefore, the managers of companies listed in stock exchange should be expected to be very careful in their predictions; but according to researches, the managers have cognitive and behavioral biases when making decisions and providing information. One of the cognitive biases is the "closed-mind bias." This bias is a kind of mental process that causes people to cling to their previous views or predictions, ignore or respond less frequently to new information. Closed-mindedness makes

people overemphasize initial estimates. As a result, they cannot react as a reasonable person in the face of new evidence (Badri, 2009).

This concept and bias is referred to in economics as "information stickiness". Recent studies on the rational expectations' patterns assuming information stickiness, such as the Mankiw and Reis model (Mankiw & Reis, 2002) have shown how information stickiness can lead to different policymaking compared to models with complete information. In explaining the causes of this type of stickiness, it is suggested that the acquisition and processing of information is costly therefore the firm should update its data set periodically. Unlike the sticky model, firms have the ability to adjust prices at any given time, but only a fraction of them are able to update the set of information used to determine their optimal price, and the rest of firms select a price that is based on outdated information. While firms have rational expectations, they change their expectations slightly due to the costs of updating pricing information sets. The likelihood that a firm will update its information at any given time follows a Poisson process. This probability, denoted by  $1-\lambda$ , is independent of the elapsed time since the last information update by the firm, so the  $1/1-\lambda$  takes time for the firm to update its database (Calvo, 1983).

Predictors have sticky expectations; they update their beliefs at any time using all available information with probability  $(1-\lambda)$ . They stick to their previous beliefs with probability  $\lambda$ . This model provides an easy way to measure Expectation stickiness using the relationship between prediction errors and revisions to past predictions. In this research, the analysis of a model started with the expected dynamisms that could be tested directly without further assumptions about the process of generating data by the predicting variable. The argument behind the model was that the predictors decide to update their expectations at discrete intervals, but cannot share new and relevant information at these intervals (Coibion, O. and Gorodnichenko, 2012).

#### Stock return

Simply put, return is the total income an investor earns during the investment period. The rate of return shows the rate of increase or decrease in the investor wealth and is calculated as a percentage of the initial investment. Return on investment is the driving force behind motivation and is a reward for investors. An evaluation of returns is the only logical way (prior to risk assessment) that investors can do to compare alternative and different investments. The return of any investment with its level of risk has a basis so that a high-risk plan is acceptable when its expected return is very high. In the financial literature, the relationship between risk and return and asset pricing has been extensively discussed. Trinor, Sharp, Linter, and Mossin developed a capital asset pricing model; which predicts whether the market monopoly factor will lead to joint changes in the stock returns of different companies (Hadian, Hashemi, Samadi, 2017).

After presenting the capital asset pricing model, various researchers have tested the model empirically and provided several evidence that the beta of the asset pricing model does not fully explain asset return (Stattman, 1980). This evidence means that other factors are needed to characterize the expected return behavior. Therefore, several researches have investigated other factors affecting the risk and return of securities and established a basis for multi-factor models. Fama and French (1992) stated that in the real world, investors pay attention to different types of risk, but the three factors including market risk, company size risk, and book value risk are the most important of them. In their empirical study, they found that the ratio of book value on market value and firm size play a large role in explaining the changes in the average returns. Based on this finding, Fama and French (1993) proposed a three-factor model for explaining stock returns (Salehi, Hezbi, Salehi, 2014). Fama and French (1993) examined the impact of factors associated with firm characteristics on the stock returns. Their model consisted of

three factors including market size, size and book value on the stock market value in order to explain the returns.

#### BACKGROUND OF THE STUDY

##### Foreign studies

In a research entitled "Stickiness of Expectations and Profitability Irregularity", Jean et al. (2016), using Analyst Forecasting Data concluded that: 1) Analysts are pessimistic about high-profit business units; 2) Profitability Irregularity is stronger for stocks backed by sticky analysts, and 3) Profitability Irregularity is stronger for stocks with more stable earnings.

Coibion and Gorodnichenko (2015) examined a topic called "Information Difficulty and Expectation Formation". They proposed a new perspective for testing complete information-based logical expectation hypotheses that could indicate whether rejecting the null hypothesis is due to information difficulty. Using data from inflation forecast by the economic analysts and subsequent revisions to these forecasts, they showed that the analysts who were more resistant to input new information into their forecasts or, in other words, had a stickier outlook, reviewed their inflation forecasts by a slower pace.

In a research entitled expectations' stickiness and profitability Irregularity using analyst forecasting data, Bouchaud, Krueger, Landier & Thesmar (2017) found that analysts on average were pessimistic about high-profit businesses. Also, profitability Irregularity is stronger for stocks backed by sticky analysts. In addition, the profitability Irregularity is stronger for stocks with more stable earnings.

##### Domestic studies

In 2018, Shams al-Dini et al. examined the effects of behavioral variables of management overconfidence, collective behavior, and investors' emotional disposition on stock returns. For this purpose, they used data from 75 companies listed in Tehran Stock Exchange during a period of 7 years from 2009 to 2016. The index of management overconfidence, investors' collective behavior, and investors' emotional disposition were calculated and their impact on stock returns was studied. A multiple linear regression model was used to analyze the data and test the hypotheses. The empirical evidence and results indicated that the behavioral variables had an adverse effect on stock returns.

Shiri et al. (2018) conducted a research on the effect of managers' expectations stickiness on the relationship between profitability persistence irregularity and stock price simultaneity. In this research, they examined these relationships using data from 178 companies over a 10-year period from 2007 to 2016 through the multivariate regression. The results indicated a significant negative relationship between the persistence of return on equity, return on assets and cash flows and the simultaneity of equity price. There was also a positive and significant relationship between gross profit and the simultaneity of equity price; the moderating variable of managers' expectations stickiness strengthened the relation of the persistence of return on equity, return on assets, cash flows and gross profit with the simultaneity of stock price.

A research was conducted in 2015 by Deylami and Safari Gerayli to investigate the relationship between corporate governance quality and stock return volatility. The research used a comprehensive index consisting of three general categories of board of directors, shareholders' equity, and information transparency to measure corporate governance quality for the test. Having conducted the study on 96 selected samples of companies listed in Tehran Stock Exchange during the years 2010 to 2014 using multivariate regression model, it indicated a negative relationship of stock return volatility with the index of the board of directors and the index of information transparency.

In a research entitled "Investigating the Behavior of Corporate Managers in Predicting Annual Profit", Ghaemi and Eskandarli

(2013) examined managers' bias in predicting annual profit and the effect of four variables, past performance of the company, managers' approach in predicting last year's profit, size and type of company ownership in the companies listed in Tehran Stock Exchange. Managers' bias in this study was measured using two criteria: growth forecast and earnings prediction error. The sample consisted of 1135 firm-years and 5334 earnings forecast announcements by companies admitted during the period 2007-2011. The analysis showed that past performance, managers' past approach to the prediction and the type of company ownership plays a role in managers' bias in predicting earnings.

Bahar Moghaddam and Kawarui (2012) studied "The relationship between days and months of the year, macroeconomic variables and stock returns in Tehran Stock Exchange" during the period of 1999-2008. The results showed that the highest stock returns on weekdays was on Wednesdays and the lowest stock returns belonged to Sundays. Regarding the months of the year, the highest stock returns belonged to the first six months and the lowest returns belonged to the second six months of the year (especially March). Also, the results of this research showed that there was no significant relationships between macroeconomic variables and highly seasonal returns.

Based on the aforementioned theoretical foundations and previous researches, the research hypothesis was formulated as follows:

Research hypothesis: Stickiness of managers' expectations has a significant effect on stock returns.

**Research method**

The results of the present research can be used by corporate managers, legislators, analysts, auditors and researchers; so given the applicability of the results to a wide range of individuals in their decision making, it could be inferred that the current research was of an applied nature and purpose. This research was a quasi-experimental study using post factum approach (through the past information). It focused on the relationships between variables thus was a correlational research. After examining the theoretical foundations and background of the research, the information needed to test the hypothesis was collected by referring to audited financial statements and seasonally forecasted financial statements of companies and companies' reports and by referring to the software of stock exchange library and the site codal.ir. Information was processed by Excel software and the variables needed for statistical tests were extracted and finally Envies 8 software was used for statistical analysis. The statistical population of the research included all the companies listed in Tehran Stock Exchange for the period 2011-2017. The companies were selected with the following limitations:

- 1) In order to homogenize the statistical sample in the years under study, they should be admitted to the Tehran Stock Exchange before 2011 and be active in the Tehran Stock Exchange from 2011 to 2017.
- 2) Exemplary companies should not be part of banks and financial institutions because the disclosure of their financial information and corporate strategic structures are different due to their non-production nature.
- 3) Companies' End of fiscal year is the end of March due to increased comparability and neutralization of corporate value conditions at the end of the year.
- 4) Companies should not stop operating and change their financial period during this period.
- 5) Required data should be available.

Finally, according to surveys, 178 companies were selected based on the maximum available information.

The model of multiple linear regression was utilized to test the hypotheses and the relationship between research variables. In the present research, managers' expectations stickiness variable was an independent variable, and the future stock returns were dependent variables, as well as the variables of

company size and financial leverage were the control variables used in the research. Model 1 was used to test the hypothesis:

Model 1

$$r_{f,t} = b_0 + b_1\lambda_{f,t} + b_2 leverage_{f,t} + b_3 size_{f,t} + \epsilon$$

$r_{f,t}$ : Stock returns calculated by the Fama and French model;

$\lambda_{f,t}$ : The coefficient of expectations stickiness of the managers of business unit f in year;

$leverage_{f,t}$ : Leverage ratio;

$size_{f,t}$ : Size of a business unit.

**Measuring variables**

Dependent variable

$r_{f,t}$ : is the stock return calculated using Fama and French three-factor model.

Fama and French Three-Factor Model: Fama and French extracted the model of equation 2 by the capital asset pricing model:

Model 2

$$R_{it} - R_{ft} = b_0 + B_{i,MKT}(R_{MKT} - R_{ft}) + B_{i,SMB}SMB_t + B_{i,HML}HML + \epsilon$$

$SMB_t$ : is a factor of firm size that after ranking companies by size, has been obtained by a difference between the simple average portfolio yield of firms larger than moderate (S/H, S/M, S/L) and the simple average of the basket yield made by companies smaller than moderate (B/H, B/M, B/L) per month. The book value factor on the market value of the company in year t, derived from the difference between the average yield of two baskets 30% high (S/H and B/H) and the average yield of two baskets 30% low (S/L and B/L) per month (Ghorbani and Khatiri, 2014). After establishing the desired basket, the factors SMB and HML were calculated based on Model 3:

Model 3

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

$$HML = (SH + BH)/2 - (SL + BL)/2$$

S/L: Companies that are small in size and have a low ratio of book-to-market value.

S/M: Companies that are small in size and have a moderate ratio of book-to-market value.

S/H: Companies that are small in size and have a high ratio of book-to-market value.

B/L: Companies that are large in size and have a low ratio of book-to-market value.

B/M: Companies that are large in size and have a moderate ratio of book-to-market value.

B/H: Companies that are large in size and have a high ratio of book-to-market value.

It should be noted that the classification of companies in the baskets was done annually for all variables, but the yield of them was calculated monthly. Also calculations of the yield of each basket in year t were made based on the basketing in year t-1 (Kimiagari, Eslami Bidgoli and Eskandari, 2007).

**Independent variable**

The variable of Managers' expectations stickiness was the independent variable of this research and its effect on future stock returns was measured, where  $\lambda_{f,t}$  represents the managers' expectations stickiness coefficient obtained by model 4.

Model 4

$$\frac{EPS_{f,k} - F_t EPS_{f,k}}{P_{f,k-1}}$$

$$= a + b \frac{F_t EPS_{f,k} - F_{t-1} EPS_{f,k}}{P_{f,k-1}} + c \cdot \text{Log}(\text{assets}_{f,k-1}) + \sigma_T + \epsilon_{f,t}$$

$(EPS_{f,k} - F_t EPS_{f,k})/P_{f,k-1}$  is the predicted earnings error per share of business unit f in year t,  $EPS_{f,k}$  is the actual profit per share of business unit f at the end year k.  $F_t EPS_{f,k}$  is the expected earnings per share of business unit f at the end of the second half of fiscal year k.  $P_{f,k-1}$  is the actual price per company share f at the beginning of fiscal year k.  $\frac{F_t EPS_{f,k} - F_{t-1} EPS_{f,k}}{P_{f,k-1}}$  is the revision of earnings forecast per share, and  $F_t EPS_{f,k}$  is the prediction of earnings per share of business unit f for year k at time t (end of second half of year k). Here t is the source of future earnings' forecast of each share and  $F_{t-1} EPS_{f,k}$  is the expected earnings per share of business unit f for year k at time t-1 (beginning of year k). The coefficient b is interpreted as the operator (factor, agent) of the stickiness parameter, which is converted to stickiness coefficient according to Model 5:

$$\lambda = \frac{b}{(1 + b)}$$

After calculating the forecast error and revising the forecast, to run Model 5 and extract the coefficient b and then the stickiness coefficient  $\lambda$ , each year of the periods under study, companies were divided into twenty-member groups (each year into twenty-member nine groups). The stickiness coefficients were calculated in each of these groups. Model of multiple linear regression was used to test the hypotheses and the relationship between research variables.

**Control variable**

The control variables of this research were size and financial leverage and their operational definitions have been as follows:

**size<sub>f,t</sub>**: is the size of the business unit and is derived from the logarithm of the total assets of the business at the end of the year.

**leverage<sub>f,t</sub>**: is the leverage ratio that is obtained by dividing the total debt by the sum of assets.

**Research findings**

Before testing the hypotheses in any research, descriptive statistics of the used variables had be computed and interpreted. Descriptive statistics are numbers that are used to express quantitatively the distribution of dimensions across an observable sample. Descriptive statistics of research variables including median, mean, minimum and maximum values and standard deviation of all independent, dependent and control variables have been presented in Table 1 for data analysis:

**Table 1: Descriptive statistics of variables**

Name of variable	Criteria of concentration			Criterion of dispersion	Criteria of distribution shape	
	Mean	Maximum	Minimum	Standard deviation	Skewness	Kurtosis
Stick	0.1287	0.78	-0.083	0.36185	-0.585	0.461
FAMA	7.2688	8.33	6.05	0.42711	-0.488	1.771
Lev	0.6047	720	47	0.5695	-0.302	-0.231
Size	6.08	7.94	5.5	0.69028	1.559	2.228

According to the information presented in Table 1, it could be stated that the variables of managers' expectations stickiness had a mean of 0.1287, minimum of -0.083, maximum of 0.78 and standard deviation of 0.36. The results showed that the managers of the sample companies in the present research, on average, entered in their decisions 0.1287 of their past beliefs and 0.8713 of new information. Also, the dependent variable of the research was the stock returns using Fama and French three-factor model, which had a mean of 7.23, minimum of 6.05, maximum of 8.33 and standard deviation of 0.43. The standard deviation of the variables represented the data dispersion around the mean.

The Jarque-Bra test was also performed to check the normality of the data distribution for each variable in order to apply

parametric tests. The results showed that the distribution of data was normal. This test was not necessary, because, according to the central limit theorem, even if the distribution of data was normal, if the number of observations was large (the number of data over 30 is called big data), the distribution of data would be close to normal and even if the population was not normal, parametric statistics could be used. The maximum, minimum, mean and standard deviation of control variables of company size and financial leverage have been given in Table 1.

At this stage of the research, the fixed effects model should be used to test the hypothesis. The test result of the above model using the fixed effects model and the estimated generalized least squares method has been presented in Table (2).

**Table 1: Results of the first hypothesis test**

Variable	Variable abbreviations	Coefficients	Standard error	Statistic t	Significance level	VIF
Constant coefficient	B	0/7	0/339	2/064	0/068	
Managers' expectation stickiness	$\lambda$	0/294	0/3459	1/027	0/048	1/23
Size of the company	Size	0/372	0/188	2/059	0/065	1/78
Financial Leverage	Leverage	0/253	1/908	0/132	0/001	2/1
Statistic F	6/521	Adjusted determination coefficient		0/5342		2/79
Probability of statistic F	0/000	Durbin-Watson statistic		2/0202		



An adjusted coefficient of determination of 0.534 indicated that 53.4% of the dependent variable changes (stock returns) have been explained by the independent and control variables presented in the model. In addition, because the Durbin-Watson statistic was 2.02, that is, in the range of 1.5 to 2.5, the model was not self-correlated. Also, the results of Table 2 showed that managers' expectations stickiness with a significance level of 0.048 and a coefficient of 0.294 and the statistical value of 1.02 was not associated positively and significantly with the return. Therefore, the first hypothesis was accepted at the error level of 5%.

## CONCLUSION

The purpose of this research was to evaluate the behavioral model of managers in predicting future profits of a business unit and its impact on stock returns. The kind of managers' look at the future and their different perceptions of future conditions and their flexibility in the speed of applying new information to their decisions makes investors rely solely on predictive earnings information regardless of managers' behavioral characteristics and their behavioral stability thus they cannot make the right investment decisions. Consequently, the overall purpose of this research was to measure the degree of stickiness of managers' expectations in the different companies and then its impact on the stock returns.

To achieve these goals, the independent variable of stickiness of managers' expectations was first calculated using the model (Coibin and Gorodnichenko, 2012 and 2015), relying on the revision components of earnings' prediction and earnings' prediction accuracy. Then, the effect of managers' expectations stickiness on the stock returns was evaluated based on Fama and French three-factor model. The results of the research showed a positive and significant relationship, which was also found in the Jane Phillips' research and the results of the present study was consistent with that. Given the foregoing, stock returns predictability is a fundamental concept in asset pricing literature. In addition to market betas, several stock-level attributes significantly predict the future stock returns. Managers' behavioral characteristics have always been among the factors influencing future stock returns. The investors have misinterpreted them when making their own decisions, leading to inaccurate decisions that are a factor in their lack of proper yield in the future. Among the things that investors may not pay attention to in their decision-makings is a cognitive bias of managers called the expectations stickiness of managers; it implies that managers adhere to their past information and do not update and fully disclose new information. This causes the information managers to disclose not all the information available, and part of it is in fact the sticky information of managers that has not been updated; this causes the information to be disclosed consistently and smoothly. That would make investors more optimistic about the current situation and ideally predict the future of the stock returns. In this research, the effect of managers' expectations stickiness on the future stock returns was measured and the results showed a significant and positive relationship between these two variables.

Based on the results of the research, investors were advised to exercise caution when using profitability signals for investment decisions, given the extent to which managers adhere to past beliefs. Because, according to the results of the research, the managers of the companies listed in Tehran Stock Exchange seem to have a sticky approach and react slowly to new information. These results in low quality gains could be incorporated correctly in the investors' decisions. Given the results of this research, which was in line with the results of Shiri's research (2018), investors are advised to not pay attention solely to the managers' predicted profits and disclosure information when investing. They should invest their funds in light of this cognitive error of managers and their adherence to disclosed information to avoid wasting resources and inappropriate investments. This research has been conducted using prediction earnings' data to calculate the managers' expectations stickiness and its relationship with

stock returns. It is suggested that the analysts' expectations stickiness can be calculated by the help of analysts' consensus and the relationship between the analysts' expectations stickiness and the yield, quality and earnings management could be tested again.

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