Print ISSN: 2008-448X
Online ISSN: 2538-3310
International Journal of Business and Development Studies
University of Sistan and Baluchestan
Homepage: https://ijbds.usb.ac.ir

Feasibility of Forecasting Stock Returns under Mispricing Valuation of Financial Information Condition

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ARTICLE INFO

Article type:
Research

Article history
Received: 21.05.2023
Accepted: 18.12.2023

Keywords:
Fundamental Financial Information, Stock Returns, Six-Factor Modelling, Mispricing Valuation.

Abstract:
This study examined the extent to which stock returns can be explained by fundamental financial information. To this end, the accuracy of predicting future stock returns under conditions of mispricing stocks, including underpriced and overpriced stocks, was evaluated. The empirical results are based on a sample of 140 companies listed on the Tehran Stock Exchange during 2006-2023. The applied methodology is based on multivariate regression analysis of panel data. In particular, the six-factor models of Fama-French (2018), Nichols-Wallen-Wyland (2017), and Rhodes croft-Robinson-Viswanathan (2005) have been calculated to investigate the extent of explaining future stock valuation and returns. The results show that most of the changes in the stock valuation of the investigated companies are explained by using fundamental financial factors. Specifically, the results indicate that undervalued companies have earned higher stock returns in the coming year compared to overvalued companies. In other words, in undervalued companies, the stock return has increased in the following year, and in overvalued companies, the future stock return has decreased. According to the provided results, investors and stock exchange regulatory bodies are advised to more sensitively examine companies that have a lower rating of incorrect stock valuation based on the models introduced in this research.

1. Introduction

The extensive progress in the use of quantitative models, behavioral sciences, and information technology, not only has triggered structural changes in accounting knowledge, also played a key role in accounting information. such progress has

Cite this article: M. Lotfi, A. Delshad and M. Asaadi (2023). Feasibility of Forecasting Stock Returns under Mispricing Valuation of Financial Information Condition . *International Journal Of Business and Development Studies*, 15 (1), 199-223. DOI: 10.22111/IJBDS.2024.47960.2095.

been even more emphasized than before with the recent development in technological innovations in information and data science. These developments have broadened the horizon of research in the field of financial accounting. Considering the need of financial analysts to accurately predict price volatility as important informative data in their decisions on risk management, portfolio allocation, value at risk assessment, option pricing, and futures contracts, thus, ignoring the effect of price bubbles will reduce the accuracy in predicting stock returns (1).

The research carried out regarding the stock price and the return has led to the emergence of two opposing views, which are known as competing hypotheses. The first one is the random walk hypothesis, which emphasizes the unpredictability of stock prices and returns. The second and opposite hypothesis believes that the price can be predicted based on a set of information (25). To this end, and based on these two hypotheses, a number of approaches emerged to investigates the financial market including the efficient market hypothesis, capital assets pricing model, arbitrage model, and both the technical and fundamental analysis.

Furthermore, empirical research in the area of stock return forecasting is based on two main streams. The first stream examines the ability to account for data to explain and predict economic events, while the second one tests the market's reaction to the disclosure of information based on accounting data (21). One good empirical example is research carried out by Nichols et al. (2017) who presented a cross-sectional model that explained about 63% of the changes in companies' stock returns by fundamental information. Their results provide evidence that the deviation values of stock returns from the model's estimated values have been useful in detecting incorrect valuations and predicting stock returns in the next period (14). On the other hand, incorrect stock pricing will happen when the stock price is different from its fundamental value or intrinsic value and the market for that stock is not efficient enough. Li et al. (2022) argues that the incorrect valuation of companies' shares in the market, originates from the shortcomings of the capital market. They found that the effects of investors' behavior and information asymmetry are major examples of the imperfect market, which is considered to be one of the main factors in the incorrect valuation of assets in the capital market (12).

In addition, the stock price of the companies reflects the expected future cash flows based on the available and obvious information. Hiding or not disclosing important information about the future aspects of the company, the lack of transparency in the financial information of companies, and market sentiment, all cause price changes without fundamental reasons and lead to incorrect valuation of companies in the capital market. Finally, incorrect information circumstances can lead to a price bubble, prone to bursting and causing a sharp decrease in the price of financial assets and potentially could create a financial-social crisis (12).

Given the importance of the issue at hand, this research focuses to study the feasibility of predicting stock returns under incorrect valuation of financial information conditions for the listed companies on the Tehran Stock Exchange. The purpose of the research is to investigate the influence of financial fundamental information on stock returns so that while examining the state of stock valuation, it is possible to obtain evidence regarding the explanatory power of stock returns by financial fundamental factors. In doing so, employing the financial information of 140 listed companies in the Tehran Stock Exchange during 2006-2023, the fundamental financial information in predicting the future return of shares under both the undervaluation and overvaluation of the shares has been investigated. In order to calculate the stock valuation, the six-factor models of Fama and French (2018), Nichols-Wallen-Wyland (2017), and Rhodes croft-Robinson-Viswanathan (2005) have been applied. The obtained results confirm that most of the changes in the stock valuation of the investigated companies are explained by using fundamental financial factors.

The article is organized into five sections as follows. After the introduction, the theoretical background of the research has been reviewed. Section three deals with methodology, research hypotheses, and specification of the model. Hypotheses testing and discussion of the results are presented in the fourth section. The last section provides results and concludes the study.

2. Theoretical Background

This section examines both the theoretical and empirical background related to stock return prediction, stock valuations, stock bubbles and valuations.

2.1. Prediction of Stock Returns

Stock returns have informational content helping investors in decision-making, forecasting, and financial analysis. Obviously, investors intend to receive higher returns, making it inevitable to act rationally in choosing stocks (22). It is widely accepted for investors and financial market analysts to use either technical or fundamental information to predict stock returns. In technical analysis, the focus is on predicting the future trend by studying the past trend. Rahman (2022) believes that changes in supply and demand can be determined and predicted by changes in price charts. Therefore, on this basis, technical analysis has three main dimensions, which are: 1) everything is included in the prices, 2) prices move according to the trend, and 3) history repeats itself. In fundamental analysis, however, stock returns are a function of macroeconomic, industry, and specific conditions of the company, including performance and financial standing, which are presented in the financial statements. In this framework, the value of securities is a function of fundamental variables that the combination of these variables creates the expected return along with the specific risk level. Therefore, fundamental analysis is relied on past and present information (7).

In addition, investors employ different models to predict returns, and each of these models are based upon different factors that will lead to rational decisions about stock selection. As is discussed in Cao et al. (2022) the first model is a capital asset pricing model that was introduced by William Sharp in 1960 and explains the relationship between risk and the expected rate of return of an asset. The assumption of the capital asset pricing model is that the market factor solely determines the risk and yield of securities, thus, the effect of all fundamental economic factors is summarized in this one factor. The second model is the arbitrage pricing model, proposed by Stephen Ross in 1976 in response to the criticisms raised about the capital asset pricing model. According to the arbitrage pricing theory, stock return is a linear function of both the fundamental and macroeconomic factors. The underline assumptions of the arbitrage pricing theory are much less than the assumptions of the capital asset pricing model, and there is no risk-free asset. The third model is the multi-factor model, which is based on various economic circumstances that may affect stock returns. Finally, in the Fama and French (1993) model, the relationship between average returns and five risk factors, namely beta, size, leverage, P/E ratio, and the ratio of book value to market value, has been tested (4). There exists evidence that there is a negative relationship between company size and average returns. Also, there is a positive relationship between the ratio of the book value to the market value of the company and the average returns, and more attention should be paid to the size factor. In addition, the ratio of book value to market value has a stronger role in average returns, which led them to design a multivariable regression to investigate the factors affecting portfolio returns (1).

2.2. Stock Mispricing and Stock Price Bubbles

Stock mispricing will occur when investors are uninformed and act irrationally. This is happening due to the lack of transparency at the company level. Empirical studies provide evidence that when there is ambiguity, poor quality and limited access to information, it would lead to either a greater degree of deviation of the market value from the intrinsic value, or an increase in the uncertainty of external investors about future cash flows (3). Furthermore, there is evidence suggests that when there is information asymmetry and managers believe that their companies' stocks are undervalued or overvalued, they avoid issuing securities and prefer to finance through debt. The result would be an inverse relationship between information asymmetry and capital structure (11).

In fact, what determines the price and intrinsic value of a company's stock in the market is the sum of supply and demand created by investors and, as a result, their understanding of investment returns based on the information obtained. But in practice, sometimes the stock price in the market is not an accurate reflection of the available information, and the market does not act logically in response to the information, because there is no perfect competition in the market and the markets are not efficient enough, consequently, the stock market price turns to be different. In addition, transaction costs are high, leading to some difficulties in measuring intrinsic value and time-consuming process (3).

Measuring the intrinsic value of an asset is the responsibility of the stock holder, that is, the stock holder should be able to measure the intrinsic value of the stock and compare it with its current price and recognize whether there is a price bubble or not. For this reason, when the bubble phenomenon occurs, the value of a share increases with an irrational process, although it is logical to expect that the value of a company's shares is subject to its current value and the prediction of its future situation, but sometimes the price changes cannot be compared with its real value. In many cases, excessive price growth will be accompanied by a sudden fall in the price, and in the stock market, those shareholders who find out about this fall later will suffer severe losses at once. In other words; a price bubble will be created when investors do not have accurate information about future prices. Under these conditions, the real market price for the assets will be a function of the expected future prices. Thus, these false expectations and incomplete information, regardless of the change in the intrinsic value of the asset, will lead to a continuous positive return in a certain period of time by shaping the time trend of the price. The abnormal expectation of returns eventually leads to the bursting of the bubble and the fall of the price; therefore, if the investor observes that the stock is valued more than its reasonable limit, the investor does not risk its minimum return and sells the asset (23). Furthermore, the stocks of companies that used advanced technologies were more prone to undervaluation of stock prices (10).

2.3. Stock Valuation Theories

There are five mainstream theories to examine stock valuation as follows.

2.3.1. Intrinsic Value Theory

Intrinsic value theory is based on future value theory, which relates the value of stocks to the present value of their future cash flows. This theory is built upon two key assumptions. First, the future is certain and the market for goods and services is complete. In such a market, the price of all goods and services is definitely determined. Second, in order to determine the value of that asset, the asset`s future cash flows must be known, as well as the discount rate. But since the future is uncertain, future cash flows cannot be determined definitively, so these figures must be estimated using accounting information (5). A number of discount models of stock valuation approaches are based upon this theory including the dividend discount model, cash flow discount model, residual profit model, and abnormal profit growth model.

2.3.2. Capital Market Theory

According to the capital market theory, factors that affect the yield and risk of securities are divided into two categories. The first category is those that are specific to a company, referred to as unsystematic risk. The second category is those that are related to the entire market, referred to as systematic risk. The main assumption of the capital market theory is based on the fact that the change in each of the securities is due to the change in the factors related to the whole market. In fact, when a person invests in several types of securities, unsystematic risk disappears and only systematic risk remains (8).

2.3.3. Capital Structure Theories

The capital structure theories mainly rely on the amount and the sources of financing a company. Thus, the purpose of determining the optimal capital structure is to determine the composition of financing sources in order to maximize the shareholders' wealth and increase the company's value. Accordingly, to determine the optimal capital structure, two factors including risk and return, should be considered. It means that the capital structure should be chosen in such a way that the risk of the company is reduced and the return of the company is increased (13).

2.3.4. Portfolio Theory

Portfolio theory states that by diversifying an investment`s basket, an investment portfolio turns out to have the same return with less risk. Therefore, investors prefer to choose a set of investments that either the expected rate of return, according to the amount of risk they have to bear, is the highest possible return, or the amount of risk is the lowest possible risk (8). Capital assets pricing model, modern portfolio model and arbitrage pricing model are among the models that were created based on this theory.

2.3.5. Chaos Theory

Chaos theory argues that there is a non-linear, dynamic, and complex process that seems to be random, but is actually determined and has a high sensitivity to the initial conditions and governs the price trend. Also, chaotic processes have two characteristics of very high sensitivity to initial conditions and sudden structural breaks in the path. As a result, based on this theory, it becomes possible to predict prices by discovering the process that governs the trend of stock prices. Chaos theory is the basis of modeling approaches such as fuzzy logic, genetic algorithm, and neural networks (16), (18).

2.4. Empirical Literature

Zhen et al. (2022) have investigated the impact of incorrect valuation of stocks and the role of information in the American options market. Their findings indicate that the stock may fall due to at least two reasons: 1) limited access to information about the market, and 2) investors' feelings be wrongly valued. Furthermore, implied volatility has a direct impact on the price volatility of option contracts and has increased the risk and yield of the stock market, which of course has led to incorrect stock pricing. Their findings also indicate that after controlling a set of economic variables such as size, liquidity, institutional ownership, volume of transactions, company-specific yield fluctuations and information integration, a reduction in stock mispricing has been observed (1).

Walkshäusl (2022) has investigated the influence of fundamental financial information on the European stock returns. The results show that the research model explains, on average, 69% of cross-sectional changes in stock prices among European companies. In this research, companies whose shares were undervalued were identified, reporting that fundamental financial information has a positive and significant effect on stock returns, and in the relevant companies, after controlling for company size, momentum, book value to market, operating profit and investment; stock price overvaluation has been observed by more than 0/54% per month (24).
Using seasonal data, Cao et al. (2019) have studied the role of hedge funds in the formation of stock prices of companies listed on the American Stock Exchange. They show that the existence of risk hedge funds in sample companies has increased stock returns by 4/8% annually and has led to correcting the mispricing process over time (2).
Firouzi and Aram (2021) findings indicate that there is an inverse relationship between unsystematic risk and stock returns. Also, they provide evidence based on Tehran Stock Exchange that both overpricing and underpricing affect the relationship between unsystematic risk and stock returns (6).
Niko, Kazem Ebrahimi, and Jalali (2020) provide evidence and experimental results indicating that both variables of investor sentiments and unsystematic volatility have a positive and significant effect on stock mispricing. This means that with an increase in investor sentiment and unsystematic volatility, the incorrect pricing of stocks also increases and vice versa. Also, the moderating role of the investor's sentiment on the relationship between unsystematic fluctuations and incorrect stock pricing has a positive and significant effect (15).

3. Methodology and Model Specification

3.1. Variables and Data

Based on the research literature, stock mispricing is considered the independent variable. For the sake of robustness, this research applied two methods to measure the incorrect valuation of stock returns namely the Rhodes Croof-Robinson-Viswanathan method, and the Nichols-Wallen-Weiland method as described following. Furthermore, there are two dependent variables including the price (market value) of the stock, and the yield of the stock. These variables have been measured using the following criteria.

3.1.1. Stock Price

The stock price is measured based on the closing price at the end of the financial year.

3.1.2. Return on Company Shares

The yield of the company's stock is the set of benefits that are assigned to the share during the period in question, and it is calculated relative to the price at the beginning of the period. The return on investment in shares in a certain period is calculated according to the first and last prices of the period and the benefits from the ownership and increase of the company's capital, as is stated in equation (1) (17).

$$R_{it} = \frac{(1+\alpha_t) \times P_{it} - P_{i\,(t-1)} + D_{it} - M}{P_{t\,(t-1)}} \quad (1)$$

Note that R_{it} is yield of stock *i* in period *t*, P_{it} is price of stock *i* in period *t*, D_{it} is dividend of stock *i* in period *t*, *M* is cash income of shareholders, and $\propto_{it}$ is capital increase ratio of company i in period t.

3.1.3. Rhodes Croof -Robinson-Viswanathan Method

Identification of stock mispricing based on the Rhodes Croof-Robinson-Viswanathan method is expressed in equation (2) (25).

$$lnMarket_{i,t} - \alpha_0 + \alpha_1 lnB_{i,t} + \alpha_2 ln(|NI|)_{i,t} + \alpha_3 ln(|NI|)_{i,t} \times D(NI_{it} < 0) + \alpha_4 LEV_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where $lnMarket_{i,t}$ is the natural logarithm of the company's market value, which will be obtained from the stock market value plus the book value of liabilities. $lnB_{i,t}$ is the natural logarithm of the book value of company *i* in year *t*. $NI_{i,t}$ is the net profit of company *i* in year *t*. $D(NI_{it} < 0)$ is a virtual variable and takes two values: if company *i* is loss-making in year *t*, its value is equal to 1, and if it is profitable, its value is considered zero. $LEV_{i,t}$ is the financial leverage of company i in year t, which is measured through the total ratio of debt to total assets. After estimating equation (2), the remaining values indicate incorrect stock valuation, so that negative residual values indicate undervaluation and positive residual values indicate overvaluation of fundamental factors by the capital market.

3.1.4. Nichols-Wallen-Weiland Method

The second method to measure stock valuation is the Nichols-Wallen-Weiland model as described in equation (3), which after estimating equation (3), the remaining values of the model are obtained using equations (4) and (5) (4).

$$PRICE_{i,t} = \sum_{j=1}^{n} \alpha_{j,t} + \gamma_1 BV_{i,t} + \gamma_2 IB_{i,t} + \gamma_3 NEG_{i,t} + \gamma_4 NEG \times IB_{i,t} + \gamma_5 DV_{i,t} + \gamma_6 OIGR_{i,t} + \varepsilon_{i,t} \quad (3)$$

Note that $PRICE_{i,t}$ is the closing price of the stock at the end of the financial year. $\alpha_{j,t}$ is a virtual variable for each of the *n* investigated industries. $BV_{i,t}$ is estimated by using the ratio of equity to the number of shares. $IB_{i,t}$ is estimated by using the ratio of profit or loss before unexpected items to the number of shares. $NEG_{i,t}$ takes two values: if the profit before unexpected items is negative, this variable will be assigned a value of one and otherwise a value of zero. $DV_{i,t}$ is the ratio of shareholders' equity of the previous period minus the shareholders' equity of present period plus net profit out of the number of shares. $OIGR_{i,t}$ *is* the ratio of the difference between the operating profit of the present period and last year to the number of issued shares.

$$VALUE_{it} = \bar{a}_{i,t} + \bar{\gamma}_1 BV_{it} + \bar{\gamma}_2 IB_{i,t} + \bar{\gamma}_3 NEG_{i,t} + \bar{\gamma}_4 NEG \times IB_{i,t} + \bar{\gamma}_5 DV_{i,t} + \bar{\gamma}_6 OIGR_{i,t} \quad (4)$$

and

$$VRES_{i,t} = \frac{PRICE_{i,t} - VALUE_{i,t}}{PRICE_{i,t}} \quad (5)$$

Note that if the residual values ($VRES_{i,t}$) takes negative values, it indicates the valuation is less than the fundamental factors, namely undervalued. If the remaining values are positive; they indicate the overvaluation of fundamental factors, namely, overvalued by the capital market.

As regards the dataset, financial data is collected from various sources, including financial statements of companies, the Tehran Stock Exchange, and Securities Organization's compact discs, namely, *Rahavard Novin* software. Excel software was used to categorize, summarize and create databases, and Eviews version 10 and SPSS version 20 software were used for modelling and testing the hypothesis.

The statistical population in this research includes listed companies on the Tehran Stock Exchange. Availability and homogeneity of information is the reason for choosing these companies as the statistical population of the research. The selected sample includes companies that have the following conditions, and in fact, the companies investigated in this research were selected by systematic elimination method based on the following criterion. 1) The financial information of the company is available for the period of the research i.e. 2006 to 2023, 2) their financial year ends at the end of March, 3) they have not changed the financial period during the period under review, 4) the company information is available and there are no more than 6 months of trading interruption, 5) during the period under review, the name of the company has not been removed from the listed companies on the Tehran Stock Exchange, and 6) the company is not part of financial institutions, banks, investment companies, etc. due to the special nature of their activities. Based on these restrictions, 140 companies over the period from 2006 to 2023 were selected making a total of 22,480 companies for investigation. Finally, the dataset is structured on a monthly basis.

3.2. Research Hypotheses

Based on the theoretical foundations, research hypotheses have been proposed as follows:

1) Most of the changes in the stock valuation of the listed companies on the Tehran Stock Exchange can be explained by using fundamental financial factors.
2) There is a significant difference between the future stock returns of undervalued companies compared to overvalued companies.
3) Undervalued companies will have higher stock returns in the next period compared to overvalued companies.

3.3. Model Specification

As stated, this research aims to investigate the influence of financial fundamental information on the stock returns of the listed companies in the Tehran Stock Exchange. Also, it attempts to provide evidence regarding the extent to which financial fundamental factors explain stock returns while examining the state of stock valuation. Furthermore; the influence of fundamental financial information in predicting the future returns of stocks in the conditions of undervaluation and overvaluation of these companies has been investigated. For this purpose, firstly, using descriptive statistics, the general situation of the research variables has been examined, and then, the research hypothesis is examined within four models as formulated in equations (6) to (9).

3.3.1. Role of Fundamental Financial Information in Explaining Stock Return

In order to explain the stock returns by fundamental financial information, Rhodes Croff-Robinson-Viswanathan (2005), and Nichols-Whalen-Weiland (2017) models have been used. For this purpose, while examining the explanatory status of the price of the company's shares in market value, by the company's fundamental factors, as formulated in equations (6) and (7), it could provide evidence regarding the ability to explain most of the changes in stock valuation by using the financial fundamental factors.

$$lnMarket_{i,t} = \alpha_0 + \alpha_1 lnB_{i,t} + \alpha_2 ln(|NI|)_{i,t} + \alpha_3 ln(|NI|)_{i,t} \times D(NI_{it}<0) + \alpha_4 LEV_{i,t} \quad (6)$$

and

$$PRICE_{i,t} = \sum_{j=1}^{n} \alpha_{j,t} + \gamma_1 BV_{i,t} + \gamma_2 IB_{it} + \gamma_3 NEG_{i,t} + \gamma_4 NEG \times IB_{i,t} + \gamma_5 DV_{i,t} + \gamma_6 OIGR_{i,t} + \varepsilon_{i,t} \quad (7)$$

3.3.2. Comparison of Future Stock Returns under Undervalued and Overvalued Conditions

To compare the future stock return under overvalued and undervalued conditions, first, the models of Rhodes Croof-Robinson-Viswanathan (2005), and Nichols-Whalen-Weiland (2017) are estimated. Then, in order to estimate stock valuation, aiming to investigate the future stock returns in conditions of undervaluation and overvaluation of fundamental factors, portfolio-based analyzes will be used. In this way, after the end of the financial year and the end of the season of financial assemblies (end of July every year), the sampled companies are ranked based on the remaining values of the model (VRES) from the lowest to the highest value and based on the quantiles of five they are divided into five portfolios. So that portfolio 1 has the lowest amount of model residuals, namely undervalued companies, and portfolio 5 has the highest amount of model residuals, namely overvalued companies. Then, the monthly return values will be examined in the next 12 months (after July). In order to compare the existence of a significant difference between the future stock returns of different portfolios, one-way analysis of variance test is employed.

3.3.3. Status of Stock Future Returns under Mispricing Conditions

In order to investigate the way that the valuation status of fundamental information affects future stock returns, the following regression model as is stated in equation (8) should be estimated (24).

$$R_{i,m} = \beta_0 + \beta_1 QVERS_{i,t} + \beta_2 SZ_{i,t} + \beta_3 BM_{i,t} + \beta_4 OP_{i,t} + \beta_5 INV_{i,t} + \beta_6 MOM_{i,m-1} + \varepsilon \quad (8)$$

Note that $R_{i,m,t}$ is the monthly return of company i in month m. $QVERS_{i,t}$ is the company's quantile based on the basic financial information in terms of valuation status, which is assigned values between 1 and 0 based on the equation (4). In this way, undervalued companies are assigned a value of one and overvalued companies are assigned a value of zero. $SZ_{i,t}$ is company size (natural logarithm of company assets). $BM_{i,t}$ is the ratio of the book value to the market value of the company. $OP_{i,t}$ is the ratio of operating profit to the total assets of the company. $INV_{i,t}$ is the company's investment ratio (the ratio of capital expenditures to total assets). $MOM_{i,m-1}$ is the stock return in the last month.

3.3.4. Status of Stock Future Returns under Mispricing Conditions Using the Fama-French Model - Supplementary Method

As a supplementary method, the six-factor model of Fama-French (2018) based on the approach of Fama-Macbeth (1973) is employed. Equation (9) shows the Fama-French model. This equation evaluates the state of future returns of stocks in different portfolios in terms of the state of valuation of fundamental information. Based on this model, the future returns of stocks in five portfolios formed on the basis that portfolio 1 is undervalued and portfolio 5 is overvalued, can be examined. Finally, the comparison of the alpha coefficient in the portfolio of undervalued and overvalued companies will be performed to obtain more evidence related to the third hypothesis (24).

$$R_{i,t} - R_{ft} = \alpha_t + \beta_1 MRKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 CMA_t + \beta_5 RMW_t + \beta_6 UMD_t + \varepsilon_{i,t} \quad (9)$$

Table 1 shows the variables involved in the Fama-French (2018) model and briefly explains the applied measurement methods.

Table 1. Fama-French Model`s Variables and Measurement Method

Variable	Measurement
Ri,t – Rft	difference in the stock return of company i in month t, compared to the risk-free return in that month.
MRKTt	Capital Market Risk, which is the difference between the market yield in the period under review and the risk-free yield for the same period. In this research, risk-free yield is the interest rate of one-year bank deposits.
SMBi, t	difference between the returns of the portfolios consisting of the shares of large companies and the portfolios consisting of the shares of small companies .(size factor)This variable is proposed in the Fama and French model to determine and control the company size factor on its additional efficiency and is measured using equation (10). $SMB=\frac{(SL+SM+SH)}{3}-\frac{(BL+BM+BH)}{3}$ (10)
HMLi, t	difference between the returns of portfolios consisting of shares of highly capitalized and low capitalized companies (book value to market value ratio factor). This variable is actually the difference between the average returns of companies with high and low value ratios and is calculated using equation (11). $HML=\frac{(SH+BH)}{2}-\frac{(SL+BL)}{2}$ (11)
RMWi,t	difference in returns between portfolios consisting of companies with high profitability and companies with low profitability, in the conditions where the factor of size and ratio of book value to market value is controlled. Profitability is measured using the ratio of pre-tax profit to total assets and is calculated by equation (12). $RMW=\frac{(SHR+SLR+BHR+BLR)}{4}-\frac{(SHW+SLW+BHW+BLW)}{4}$ (12)
CMAi,t	difference in returns between portfolios consisting of companies with low investment (conservative) and high investment (bold) which is controlled by the size and ratio of book value to market value. Investing using the growth percentage of the ratio of inventory of materials and goods and tangible and intangible fixed assets to total assets compared to last year; and is measured by equation (13) (19). $CMA=\frac{(SHC+SLC+BHC+BLC)}{4}-\frac{(SHA+SLA+BHA+BLA)}{4}$ (13)
UMDi,t	difference between the monthly return of the past winning stock portfolio and the monthly return of the past losing stock portfolio is in the conditions where the factor of size and ratio of book value to market value is controlled. In fact, this variable explains the sensitivity of the expected stock return to the difference in the past performance of the company's shares in terms of the returns they have already achieved, and it is calculated from equation (14) (19). $UMD=\frac{(SHU+BHU+SLU+BLU)}{4}-\frac{(SHD+BHD+SLD+BLD)}{4}$ (14)

Source: Research Findings

Within the Fama-French (2018) modeling framework, as described in equation (9), at the end of each year, all companies are ranked based on their size. Then the middle company is used to divide shares into two categories. The first group includes shares whose market value is lower than the median, and the second group is the one with shares whose market value is greater than the median. After that, all the companies that are placed in one of these two groups are ranked every year based on the ratio of book value to market value. At this stage they can be divided into three categories: 30% of shares are divided into baskets with high ratio (High), 30% into baskets with low ratio (Low) and 40% into baskets with middle ratio (Median) from book value to market value. As a result, six different portfolios are obtained from the combination of these two divisions. 1) SL, SM, SH: These portfolios include small-sized shares and have large, medium and small book value to market value ratios, respectively. 2) BL, BM, BH: These portfolios include large-sized stocks and have a ratio of book value to market value of large, medium and small, respectively. The reason why stocks are divided into two categories based on size, and three categories based on the ratio of market value to book value is that the Fama-French (2018) studies confirms that the ratio of book value to market value has a stronger role in justifying stock returns compared to the share size (9).

4. Empirical Results and Discussion

4.1. Descriptive Statistics

Before proceeding to the results, table (2) presents the descriptive statistics of the variables. It should be mentioned that outliers were removed using the trimming technique. Also, the normal distribution properties of the dependent variable are ensured implying that the obtained results satisfy normal distribution properties for future stock returns variable. Finally, both the stationarity and convergence properties of the variables have been concluded.

Table 2. Descriptive Statistics

Variables		Average	Median	Sndardta Deviation	Skewness Coefficient	Slendernes Ratio	Min	Max
Title	Symbol							
Normal Stock Returns	R	0/061	0/002	0/249	1/051	2/136	-0/435	1/073
Company Size	SZ	6/138	6/064	0/69	0/829	1/380	4/291	9/020
Book Value to Market Value	BM	0/658	0/670	0/291	0/042	-0/266	0/013	1/845
Operating Profit Ratio	OP	0/152	0/130	0/139	0/418	1/196	-0/614	0/676
Company's Investment Ratio	INV	0/041	0/026	0/045	1/937	3/719	0/001	0/210
Additional Monthly Stock Returns	Ri-Rf	0/045	-0/014	0/249	1/052	2/146	-0/452	1/058
Expenditure On Capital Market Risk	MRKT	0/014	0/005	0/082	1/234	2/806	-0/133	0/351
Size Factor	SMB	-0/006	-0/002	0/070	-1/001	2/658	-0/243	0/140

Market Value Factor	HML	-0/069	-0/041	0/133	-2/130	5/749	-0/589	0/152
Profitability Factor	RMW	-0/002	0/004	0/129	-1/126	4/968	-0/482	0/331
Average Investment Factor	CMA	-0/020	-0/015	0/057	-0/270	0/620	-0/162	0/115
Momentum Factor of Stock Returns	UMD	0/096	0/058	0/143	1/817	3/461	-0/131	0/557

Source: Research Findings

The results of the descriptive statistics as is presented in Table (2) show that the average monthly stock return in the sampled companies is equal to 0/061. Also, the average ratio of book value to market value (BM) is equal to 0/658, indicating that the book value of sampled companies was about 66% of their market value. furthermore, the ratio of operating profit (OP) is equal to 0/152, which means that the operating profit earned in the sampled companies was close to 15% of total assets. Other findings indicate that the average investment ratio (INV) is equal to 0/041 and about 4% of the total assets of the companies have been invested in the form of capital expenditures. The average additional monthly stock return (Ri-Rf) is also equal to 0/045, therefore, the monthly return obtained in the sampled companies was nearly 4% more than the risk-free return. Moreover, the average monthly capital market risk (MRKT) is equal to 0/014, indicating the excess return on the risk-free return in the entire capital market during the research period.

As regards the size factor (SMB) in the Fama-French (2018) model, it is equal to -0/006, while the negative sign of this value indicates that the stock returns of small companies are lower than the stock returns of large companies. The market value ratio factor (HML) is also equal to -0/069, and the negative value of this value indicates that the return on shares of companies with a high book value ratio was lower than that of companies with a low book value ratio. Other results indicate that the average variable of profitability factor (RMW) is equal to -0/002 and this means that the monthly yield of companies with high profitability was slightly lower than companies with low profitability. The average investment factor (CMA) is equal to -0/020, which shows the lower monthly returns of companies with conservative investment compared to companies with bold investment. Finally, the average stock return momentum factor (UMD) was equal to 0/096 and it indicates that the return of the winning portfolio was about 10% higher than the losing portfolio.

4.2. Stock Valuation Based on Financial Fundamental Factors

Table (3) presents the results of stock valuation based on financial fundamental factors using the regression models of Rhodes Croff-Robinson-Viswanathan (2005), and Nichols-Wallen-Weiland (2017). For this purpose, firstly, the situation of explaining the market value of the companies by fundamental factors is examined. Then analyzing the coefficient of determination, explainable properties of financial fundamental factors regarding to changes in stock valuation is discussed.

Table 3. Rhodes Croof-Robinson-Viswanathan VS Nichols-Wallen-Wyland Stock Valuation

Rhodes Croof- Robinson-Savanathan				Nichols-Whalen -Weiland			
Variable	**Symbol**	**Coefficient**	**Significance Level**	**Variable**	**Symbol**	**ficientCoef**	**Significance Level**
Intercept	C	-2/774	-086/9 ***	Intercept	C	3790/28	4/896 ***
Natural Logarithm of Book Value	Ln B	1/134	50/694 ***	Equity	BV	0.277	0.692
Company Net Profit	Ln |NI|	0.112	10/274 ***	Profit (loss) before unexpected items	IB	6/861	8/418 ***
Loss of the company	Ln |NI|*D(NI<0)	-0.013	-3/428 ***	Existence of loss	NEG	-478/439	0.335-
Financial Leverage	LEV	0.2390	2/535 **	Existence of losses before unexpected items	NIG*IB	725/8	-049/5 ***
				dividends	DV	-0.843	203/2 **
				ting Opera profit growth	OIGR	0.263	0.519
F test		226/710		F test		14/976	
Significance level		0.000		Significance level		0.000	
Coefficients of Determinations		0.947		coefficient of determination		0.546	
Durbin-Watson		1/832		Durbin-Watson		1/977	
Fixed effects control		Yes		Fixed effects control		Yes	

Source: Research Findings

As presented in Table (3), the value of the F statistic of the model in both models validates modeling approach and research variables. In addition, the results of Durbin-Watson statistic indicate the lack of autocorrelation of the residuals. The coefficient of determination of the model based on the Rhodes Croof-Robinson-Viswanathan model is equal to 0/947 and those of Nichols-Whalen-Weiland is equal to 0/546, which indicates that the majority of changes in the dependent variable (company value) are explained by the independent variables (fundamental factors). These findings indicate that the first hypothesis of the research, that most of the changes in the valuation of shares of listed companies in the Tehran Stock Exchange can be explained using fundamental financial factors, was confirmed at the 95% confidence level.

4.3. Comparison of Future Stock Returns in Different Portfolios in terms of Stock Undervaluation and Overvaluation

In order to compare the future yield of stocks in different portfolios from the state of stock valuation; first, the sample companies were divided into 5 portfolios (1 for undervalued portfolio and 5 for overvalued portfolio) based on the stock valuation criteria in each year, and the average future stock returns of different portfolios were compared with each other. The obtained results are described in Tables (4) and (5).

Table 4. Comparing the Average Stocks Future Returns for Different Portfolios Based on Rhodes Croof-Robinson-Viswanathan Model

Companies Portfolios based on Stock Mispricing	Identification of mispricing of stocks based on Rhodes Croof- Robinson - Savanathan criteria						
	Average	Comparison Between Groups, Difference of Means (i-j)				One-Way Analysis of Variance (ANOVA) Test	
		i	J	Difference	Significant	Difference	Significant
Portfolio 1 (Undervalued)	0.067	1	2	0.005	0.336	1/929	**0.103**
			3	0.012	0.024		
			4	0.004	0.443		
			5	0.012	0.025		
Portfolio 2	0.062	2	1	-0.005	0.336		
			3	0.007	0.197		
			4	-0.001	0.845		
			5	0.007	0.202		
Portfolio 3	0.055	3	1	-012/0	0.024		
			2	-0.007	0.197		
			4	008/0	0.137		
			5	0.000	0.992		
Portfolio 4	0.063	4	1	0.004	0.443		
			2	0.001	0.845		
			3	0.008	0.137		
			5	0.008	0.142		
Portfolio 5 (Overvalued)	0.055	5	1	-012/0	0.025		
			2	-0.007	0.202		
			3	0.000	0.992		
			4	008/0	0.142		

Source: Research Findings

The presented results in Table (4) show that the average future return of stocks in portfolio 1 is equal to 0/067 and in portfolio 5 is equal to 0/055. To compare the average between different portfolios two types of tests have been performed. 1) A comparison test between groups (LSD), as a part-by-part comparison between portfolios, and 2) a one-way analysis of variance (ANOVA) test to compare all groups.

Table 5. Comparing the Future Stocks Returns for Different Portfolios Based on Nichols-Whalen -Weiland Model

Companies Portfolios based on Stock Mispricing	Identification of Mispricing of Stocks based on Nichols-Wallen-Weiland criteria						
	Average	Comparison Between Groups, Difference of Means (i-j)				One-Way Analysis of Variance (ANOVA) Test	
		I	J	Difference	Significant	Difference	Significant
Portfolio 1 (Undervalued)	0.072	1	2	0.009	0.073	3/014	**0.017**
			3	0.015	0.004		
			4	0.013	0.012		
			5	0.016	0.003		
Portfolio 2	0.062	2	1	-009/0	0.073		
			3	0.006	0.284		
			4	0.004	0.468		
			5	0.006	0.228		
Portfolio 3	0.057	3	1	-0.015	0.004		
			2	-0.006	0.284		
			4	-0.002	0.726		
			5	0.001	0.890		
Portfolio 4	0.059	4	1	-0.013	0.012		
			2	004/0	0.468		
			3	0.002	0.726		
			5	0.003	0.626		
Portfolio 5 (Overvalued)	0.056	5	1	-0.016	0.003		
			2	-0.006	0.228		
			3	-0.001	0.89		
			4	-0.003	0.626		

Source: Research Findings

The findings presented in Table (5) indicate that the difference in future stock returns between the undervalued portfolio and the overvalued portfolio is significant. Additionally, the results show that the average future return of stocks in portfolio 1 is equal to 0/072 and in portfolio 5 is equal to 0/056 and this difference is statistically significant. Furthermore, the findings obtained from the variance analysis test show that there was a significant difference between the future stock returns in different portfolios, in terms of the state of future stock returns. These results indicate that the second hypothesis of the research that there is a significant difference between the future stock returns of undervalued companies compared to overvalued companies, is confirmed at the 95% confidence level.

4.4. Future Return Under Mispricing Stock Conditions

In order to investigate the way that fundamental information affects future stock returns, a regression model using panel data is employed; Table (6) presents the results.

Table 6. The Effect of Stock Valuation on Future Returns

Variables	Symbol	Results Based on Stock Valuation Criteria			
		Croff-Rhodes-Robinson-Savanathan criterion		Nichols- Wallen - Weiland criterion	
		Coefficient	Significant	Coefficient	Significant
Intercept	C	-0/465	-10/950***	0/354	-8/871***
Stock Valuation Quantile	QVERS	0/056	8/025***	0/026	3/907***
Company Size	SZ	0/074	11/727***	0/057	9/633***
Book Value to Market Ratio	BM	0/144	14/429***	0/113	12/117***
Operating profit ratio	OP	-0/200	1/181	-0/022	-1/224
Company's Investment Ratio	INV	0/143	3/366***	0/138	-3/253***
Stock Returns Last Month	MOM	0/203	31/040***	0/206	31/398***
F test		10/008***		9/661***	
Portfolio Determination Factor		0/061		0/059	
Durbin-Watson Statistics (DW)		2/032		2/033	
Presence of Fixed Effects		Yes		Yes	
Type of Fixed Effects		random-Non		random-Non	
*Significant at the 90% Confidence Level		**Significant at the 95% Confidence Level		***Significant at the 99% Confidence Level	

Source: Research Findings

It can be observed that the F statistic of both models is significant confirming that there is a significant relationship between variables, and validates the research model. Also, the results of Durbin-Watson's statistics show the lack of autocorrelation of residuals. In addition, the findings obtained from the variance inflation test indicate that there is no collinearity between the independent variables.

The results obtained regarding the stock valuation variable (QVERS) show that based on the stock valuation criteria of Rhodes Croof- Robinson-Viswanathan, it has had a positive and significant effect on future stock returns, and in undervalued companies, stock returns have increased in the coming year, while in overvalued companies, future stock returns have decreased. Also based on Nichols-Wallen- Wayland stock valuation criteria, the positive and significant impact of stock valuation on future stock returns has been confirmed.

This result indicates that in undervaluation circumstances, the amount of the future return of the stock is increased, while in the case of overvaluation, the amount of the future return of the stock is reduced. The overall results indicate that the third research hypothesis that assumed undervalued companies have higher stock returns in the next period compared to overvalued companies, is confirmed at the 99% confidence level.

4.5. Effect of Under (Over)Valuation of Stocks on the Future Stock Returns Using Fama-French Multi-Factor Model

As a supplementary method to test the hypothesis, the six-factor Fama-French (2018) model has been employed. For this purpose, future stock returns in different portfolios are investigated in terms of fundamental information. In this model, the future stock's return is divided into five portfolios and then, the alpha coefficient is compared in the portfolio of undervalued companies (portfolio 1 represents undervalued stocks), and overvalued companies (portfolio 5 represents overvalued stocks).

Table 7. Fama-French Models based on Different Portfolios Stock Valuation Status

Variables	Symbol	Rhodes Croff-Robinson - Savanathan criterion		Nichols- Wallen -Weiland criterion	
		Portfolio 1- Undervalued	Portfolio 5- Overvalued	Portfolio 1- Undervalued	Portfolio 5- Overvalued
Intercept	C	0/001**	-0/001	0/002***	-0/001
Market Factor	MRKT	0/021***	0/029***	0/022***	0/028***
Size Factor	SMB	0/002	-0/004	0/004	0/001
Market Value Factor	HML	-0/024***	0/011**	-0/024***	-0/025***
ProfitabilityFactor	RMW	0/003	-0/020**	0/009	0/001
Average Investment Factor	CMA	0/012***	-0/010***	-0/015***	0/012***
Stock Return Impulse Factor	UMD	0/040***	0/038***	0/036***	0/034***
F test		94/028***	96/335***	123/853***	78/279***
Portfolio Determination Factor		0/809	0/813	0/848	0/779
Durbin-Watson Statistics (DW)		2/084	2/125	1/848	1/956
*Significant at the 90% Confidence Level		**Significant at the 95% Confidence Level		***Significant at the 99% Confidence Level	

Source: Research Findings

As reported in Table (7), the F statistic of the model under different criteria and portfolios confirms the modelling approach and provides evidence that there is a significant relationship between research variables. Also, the results obtained regarding Durbin-Watson's statistics show the lack of residual autocorrelation.

Furthermore, the results obtained from the market factor variable (MRKT), which indicates the excess return of the capital market compared to the risk-free return, indicate the positive and significant influence of this factor on the excess return of stocks. This positive value indicates that with the increase of the abnormal return of the market (market factor), companies' additional return has increased.

The results of the size factor variable (SMB) which shows the difference in stock returns of small and large companies, indicate the positive but meaningless influence of this variable. furthermore, the Market value factor (HML), which represents the difference in monthly returns of companies with a high and low book value to market value ratio, shows that this factor had a negative and significant effect on the dependent variable, and this result indicates that an increase in the company's market value, the amount of additional return on shares has decreased.

Other findings indicate that the profitability factor (RMW), which shows the difference between companies' stock returns with high and low profitability, does not have a significant effect on stocks' excess return, and the investment factor (CMA), which represents the difference between companies monthly returns with conservative and bold investments has had a negative and significant effect on the additional stock's returns. Finally, the stock return momentum, which represents the difference between the return of the winning and the losing portfolios, has had a positive and significant effect on the dependent variable.

Table (8), presents the values of the alpha coefficient in different portfolios in terms of stock valuation status based on different criteria for measuring fundamental information valuation. As can be seen, the alpha coefficient in Rhodes Croof- Robinson-Viswanathan criteria and undervalued and overvalued portfolios are equal to 0/0014 and -0/0008, respectively, and the alpha coefficient is higher in the portfolio of low companies. In order to ensure the existence of a significant difference between the alpha coefficient values in different portfolios, the pairwise comparison test was used. The obtained results show that there is a significant difference between the alpha coefficient of the undervalued and the overvalued stock portfolio. The findings regarding the alpha coefficient of different portfolios based on the criteria of Nichols-Wallen-Weiland also indicate that the alpha coefficient of the undervalued portfolio is higher than the overvalued one in the coming year.

The overall results show that the alpha coefficient of the undervalued portfolio is significantly higher than the overvalued portfolio, which means that stocks' future returns in this portfolio are higher. According to the supplementary model, the results confirm the third hypothesis, implying that undervalued companies have higher stock returns in the next period compared to overvalued companies, at the 95% confidence level.

Table 8. Comparing Alpha Coefficients by Different Portfolios Stock Valuation Status

Portfolio Criteria	Average Coefficient of Alpha in Different Portfolios		Results of Comparing Alpha Coefficients between Different Portfolios	
	Portfolio 1-Undervalued	Portfolio 5-Overvalued	Alpha Coefficient Difference	Paired Comparison Test
Croff-Rhodes-Robinson - Savanathan criterion	0/0014	0/0008	0/0022	2/064**
Croff-Rhodes-Robinson - Savanathan criterion	0/0017	0/0007	0/0024	2/516**
*Significant at the 90% Confidence Level	**Significant at the 95% Confidence Level		***Significant at the 99% Confidence Level	

Source: Research Findings

5. Conclusion and Policy Recommendations

This research was conducted aiming to investigate the impact of financial fundamental information on the stock returns of listed companies in the Tehran Stock Exchange to obtain evidence regarding the explanatory potential of stock returns by financial fundamental factors. For this purpose, the financial information of 140 listed companies in the Tehran Stock Exchange, over the period spanning from 2006 to 2023, has been extracted and the impact of fundamental financial information on predicting stocks' future return under overvaluation and undervaluation conditions has been investigated.

The findings show that most of the changes in the valuation of the shares of the listed companies can be explained based on the fundamental financial factors used in the models proposed by Rhodes Croof- Robinson-Viswanathan (2005), and Nichols-Wallen-Weiland (2017). The results obtained from the comparison of the average stocks' future returns in undervalued and overvalued portfolios show that the average future return of shares in the undervalued portfolio was significantly higher than those of overvalued portfolio. This result indicates that the undervalued portfolio has a higher stock return than the overvalued companies.

The findings regarding the influence of the valuation status of companies based on fundamental information on future stock returns indicate that in undervalued companies, stock returns increased in the following year and in overvalued companies future stock returns are reduced. In other words, undervalued companies earned higher stock returns in the next year compared to overvalued companies. The results obtained based on the Fama-French six-factor modelling approach, indicate that in the next year, undervalued companies will have a higher alpha coefficient and specific return than overvalued companies. This result is a confirmation and re-emphasis on the findings indicating that undervalued companies have obtained higher returns in the coming year compared to overvalued companies.

According to the provided results, three policy recommendations can be inferred. First, investors and stock exchange regulatory bodies are advised to examine more sensitively companies that have a lower rating of incorrect stock valuation based on the models introduced in this research. Second, it is suggested that the Tehran Stock Exchange Organization, as the most important capital market institution in Iran, provide a summary of crucial and accurate information to capital market actors, so that they can understand the way of valuing the company's shares based on the provided information and create better decision-making bases for them. Third, it is recommended to the standard-setting authorities and institutions in charge of accounting pay special attention to the requirements and framework of companies' stock valuation, so as to provide strong bases for the decision-making of stock exchange activists.

Finally, due to the importance of the research topic for different groups of investors, analysts, stock exchange managers and professional accounting associations, it seems necessary to conduct future research on the relationship between management characteristics and stock mispricing, to investigate the effect of company innovation on stock mispricing, to study the relationship between fulfilling social responsibility and stock mispricing, investigating the effect of corporate governance mechanisms on stock mispricing, and investigating the reaction of the capital market to stock mispricing.

Acknowledgments

The authors would like to thank the Tehran Stock Exchange Organization for accessing the data of the companies through Rahevard Novin software.

Data Availability

Datasets related to this article are available from the corresponding author upon request.

Research Funding

This work was supported by the Vice President for Research at Golestan University, grant number 1583.

Conflict of Interest

The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript and there is no conflict of interest.

References

1. Cao, Z., Chelikani, S., Kilic, O., & Wang, X. Implied volatility spread and stock mispricing. *Journal of Behavioral Finance*, 2022, 1-13.
2. Cao, C., Chen, Y., Goetzmann, W. N., & Liang, B.. Hedge funds and stock price formation. *Financial Analysts Journal*, 2018, 74(3), 54-68.
3. DeLisle, J., Diavatopoulos, D., Fodor, A., & Kassa, H.. Variability of Mispricing Characteristics and Future Stock Returns. 2022, Available at https://ssrn.com/abstract=4230487.
4. Fama, E. F., & French, K. R. Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, 1993, 33(1), 3-56.
5. Fisher, I. The Nature of Capital and Income. *New York: Cosimo Classics*, 1906.
6. Firouzi, H & Aram, M. Unsystematic volatility, returns and incorrect stock pricing. *Journal of New Research Approaches in Management and Accounting*, 2021, 138-160.
7. Hanauer, M. X., Kononova, M., & Rapp, M. S. Boosting agnostic fundamental analysis: Using machine learning to identify mispricing in European stock markets. *Finance Research Letters*, 2022, 48, 102856.
8. Hendriksen, E & Van Breda, M. Accounting Theory. Illinois, *Richard D Irwin*, nc., Homewood, Illinois, 1982, 4.
9. Kimiagari, A. M, B, Gh. E, Eskandari, M. Test of the Fama-French Three-Factor Model in Tehran Stock Exchange. *Financial Research Journal*, 2007, 9(23), doi: 20.1001.1.10248153.1386.9.23.5.0.
10. Klevmar Preda, L., & Lyckhage, M. *R&D Expenditures and Subsequent Market Performance*. 2021,
11. Lee, J. Information asymmetry, mispricing, and security issuance. *The Journal of Finance*, 2021, 76(6), 3401-3446.
12. Li, W., Yang, X., & Yin, X. Non-state shareholders entering of state-owned enterprises and equity mispricing: Evidence from China. *International Review of Financial Analysis*, 2022, 84, 102362.
13. Nakhai, H & Hassanzadeh, B. 2020, An income based on capital structure. *New researches in management and accounting*, 3 (25), 87-99.
14. Nichols, D. C., Wahlen, J. M., & Wieland, M. M. Pricing and Mispricing of Accounting Fundamentals in the Time-Series and in the Cross Section. *Contemporary Accounting Research*, 2017, 34(3), 1378-1417.
15. Niko, Haniyeh; Ebrahimi, Seyed Kazem & Jalali, Fatemeh. Investor's emotional tendency, unsystematic volatility and incorrect stock pricing in companies listed on Tehran Stock Exchange. *Financial management strategy*, 2020, 28(8), 85-65.
16. Oestreicher, C.. A history of chaos theory. *Dialogues in clinical neuroscience*, 2007, 9(3), 279-289.

17. Raei, R & Talangi, A. Advanced investment management. *Samt public*, Tehran, Iran, 2008.
18. Rahman, M. A. Forecasting stock prices on the basis of technical analysis in the industrial sectors of the UK stock market, *Doctoral dissertation, Cardiff Metropolitan University*, 2021, https://figshare.cardiffmet.ac.uk.
19. Ramezani, J., & Kamyabi, Y. Evaluate the effect of momentum the explanatory models feature five factors in explaining stock returns. *Financial Knowledge of Securities Analysis*, 2017, 36(10), 45-57.
20. Rhodes–Kropf, M., Robinson, D. T., & Viswanathan, S. Valuation waves and merger activity: The empirical evidence. *Journal of financial Economics*, 2005, 77(3), 561-603.
21. Saghafi, A., & Sheri, S. Role of Fundamental Accounting Information in Predicting Stock Return. *Empirical Studies in Financial Accounting*, 2004, 2(8), 87-120.
22. Shen, H., Zheng, S., Xiong, H., Tang, W., Dou, J., & Silverman, H. Stock market mispricing and firm innovation based on path analysis. *Economic Modelling*, 2021, 95, 330-343.
23. Usman, M. Price efficiency, bubbles, crashes and crash risk: evidence from Chinese stock market. *Prague Economic Papers*, 2022, 30(3-4), 236-258.
24. Walkshäusl, C. Predicting stock returns from the pricing and mispricing of accounting fundamentals. *The Quarterly Review of Economics and Finance*, 2021, 81, 253-260.
25. Watts, R. L., & Zimmerman, J. L. (1986). *Positive accounting theory*. 1986, https://ssrn.com/abstract=928677.

امکان‌سنجی پیش‌بینی بازده سهام در شرایط ارزشگذاری نادرست اطلاعات مالی

چکیده:
هدف پژوهش حاضر بررسی میزان توضیح‌دهندگی بازده سهام توسط اطلاعات بنیادی مالی است که بدین منظور پیش‌بینی بازده آتی سهام در شرایط ارزش‌گذاری نادرست سهام (کم ارزش‌گذاری و بیش ارزش‌گذاری شده) امکان‌سنجی شده است. برای دستیابی به هدف پژوهش، تعداد 140 شرکت پذیرفته شده در بورس اوراق بهادار تهران برای دوره زمانی 1384 تا 1401 انتخاب شد و روش آزمون فرضیه‌ها، مدل رگرسیون چند متغیره در مجموعه داده‌های ترکیبی می‌باشد. جهت بررسی میزان توضیح بازده آتی سهام و محاسبه وضعیت ارزشگذاری سهام از مدل‌های شش عاملی فاما و فرنچ (2018)، نیکولز، والن و ویلند (2017) و رودز-کروف، رابینسون و ویسواناتان (2005) استفاده شده است. نتایج نشان می‌دهند که بخش عمده تغییرات در ارزشگذاری سهام شرکت‌های بررسی شده با استفاده از عوامل بنیادی مالی تبیین شده است. سایر نتایج حاکی از آن است که شرکت‌های کم ارزش‌گذاری شده در مقایسه با شرکت‌های بیش ارزشگذاری شده، بازده سهام بالاتری را در سال آتی کسب کرده‌اند. به عبارت دیگر در شرکت‌های کم ارزش‌گذاری شده، بازده سهام در سال بعدی افزایش یافته و در شرکت‌های بیش ارزش‌گذاری شده از میزان بازده آتی سهام کاسته شده است.
کلمات کلیدی: بازده سهام، ارزش‌گذاری نادرست سهام، کم ارزش‌گذاری سهام، بیش ارزش‌گذاری سهام و اطلاعات بنیادی مالی.