

Analyzing the behavior of value stock price and growth stock price with stock price crash risk

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Abstract

The research investigated the relationship between the growth stock price and value stock price with the stock price crash risk in the listed companies in the Tehran Stock Exchange in this research. The methodology of this research is descriptive correlation whose design is experimental and uses a post-event approach. The multivariate linear regression based on panel data and a combination of cross-sectional and time series will be used to test the research hypotheses which we will investigate the effect of the independent variable on the dependent variable by statistical and econometric methods. Meanwhile, 98 listed companies in the Tehran Stock Exchange for ten years from the beginning of 2013 to the end of 2022 were selected through systematic sampling, the necessary data were extracted, and the developed hypotheses were tested. It was concluded after passing the mentioned steps that the effect of the behavior of growth stock price and value stock price on stock price crash risk is different, and these findings are aligned with the findings of Fulkinshitin et al. [6].

Keywords: growth stock, value stock, stock price crash risk
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Introduction

One of the most salient specifications of today's industrial world is the presence of large stock companies that control the economy of most countries, and the capital of these companies is provided by the savings of millions of investors (shareholders). In these companies, the shareholders (company owners) select the management, instead, the management has to try to provide the maximum benefits of the interests of the shareholders. The managers who seek to maximize the welfare (wealth) of shareholders are trying to maximize the value of the company's shares. In addition, the higher the stock price is, the more management has done its job better from the shareholders' point of view. Therefore, the company's stock market price is an index to evaluate management performance. The process of expansion and increasing complexity of organizations in today's advanced world, the emergence of new areas of business and operations, intensifying competition, innovations, quick and continuous changes in technology, the development of electronic commerce, the arrival of various types of fraud, have made the need to change reporting methods and providing financial information inevitable. The information is presented desirably when the relevant users, their needs, complexity, and above all, their ability to process information can be determined. In addition, a kind of proportion should be obtained between their conflicted needs to disclose information on one hand and summarize the great volume of data on the other hand. The information is obtained from the most valuable assets in the stock market [5].

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Theoretical bases

The presence of sufficient information in the market and the quick and timely reflection of information on the securities price imply the efficiency of the market, and the economic goals expected from the capital market are mainly obtained in the conditions of market efficiency. An important feature of an efficient market is that the price set in the market is a proper index for the real value of securities. The level of public trust, one of the requirements and the institutional context of quantitative development is strengthened in the dimensions of increasing value, volume, number of transactions, and so on in such a market. The most important factors in the theory of information are to be useful and accurate, timely, referable, and capable of inference, which we realize that capitalized companies are only a part of the effective elements in this regard based on the scope of the information usage. Exchangers in the capital market, as the ones who play an essential role in market mechanisms, can impress the securities price in different ways. The stock price is generally a result of companies' profitability, investors' expectations about the future of the company and the relevant industry, and the release of information. As we know, the capital market is the meeting place of two groups of investors; one is a supplier and the other is a demander. The intersection of the expectations of these two at one point will show the extent of the differences and similarities of the investors' expectations regarding the future of a share and whatever the expectations of the demanders. The better the demanders expect for their future, the higher the probability of stock price growth will be [7]. The issue of sudden changes in stock prices has attracted the attention of many academics and professionals in recent years, especially after the 2008 financial crisis. These changes occur in two forms crash and jump in stock prices. Due to the importance that investors attach to their stock returns, the stock price crash phenomenon, which sharpens the decrease in returns, has attracted the attention of researchers more than jumps. The definition of a stock price crash has three definite features: a) a stock price crash is a very large and unusual change in stock price that occurs without an important economic event; b) these very large changes are negative; and c) stock price crash is a contagious phenomenon in the market. That says the decrease in stock prices is not limited to a specific stock but includes all types of stocks in the market [5]. It should be noted that the fundamental analyst of the stock price investigates whether the company's stock price has been determined correctly or not after studying and determining the national economic conditions, the state of the industry, and finally the company. Although technical analysis cannot be as useful as fundamental analysis in the long term, using fundamental analysis may be ineffective in the short term. Fundamental analysis relies on variables that have changed in the short term, and often this change is not noticeable to market participants. For example, the GDP variable does not change significantly during the day, week, and even in some cases during a month, or at least it is not reported. Fundamental analysis requires the collection and analysis of many expensive variables that reduce their usefulness even in the medium and long term. If this hypothesis that prices reflect all information is correct and the theory of rational information, which is accepted by economists and financial analysts, is taken into account, the market will only respond to the new flow of information, and the old information based on application in the analysis is not valuable. Of course, it should be noticed that if the flow of information is random and all past and present information is included in the prices, the technical analysis itself will be worthless. This issue is not true because of the slow flow of new information, the directionality of the price, the difference in the analytical power of analysts in the financial markets, and at least with the current speed of information transfer and securities exchanges in the financial markets [8].

Research background

Domestic background

Fataahi [3] investigated the effect of accounting conservatism on the stock price crash risk of the listed companies in the Tehran Stock Exchange. The result of the research showed the existence of a significant negative relationship between conservatism and the company's future stock price crash risk .

Mirzaei [14] investigated the relationship between information uncertainty and stock price crash risk reduction. The obtained results showed that by considering other factors constant, information uncertainty reduces the probability of future stock price crashes of companies. However, in companies with low and high information asymmetry, information uncertainty does not affect the possibility of future stock price crash reduction of companies.

Asadi [1] investigated the relationship between the quality of accounting information, the delay in stock price adjustment, and the predictability of future stock returns. The results of the research showed an inverse and significant relationship between the low quality of accruals and the delay in stock price adjustment. There is no significant relationship between profit management and delay in stock price adjustment. There is an inverse and significant relationship between conservatism and delay in stock price adjustment. There is an inverse and significant relationship between the quality of accruals and the predictability of future stock returns. There is no significant relationship

between earnings management and the ability to predict future stock returns. There is no significant relationship between conservatism and the ability to predict future stock returns. Finally, there is no significant relationship between the delay in stock price adjustment and the ability to predict future stock returns.

Mehri [13] investigated the prediction of the stock price by GMDH type neural network (case study: food and beverage industries of the Tehran Stock Exchange). The results showed that the GMDH-type neural network generally has a remarkable ability to predict stock prices with high accuracy .

Kargarbarzi [10] investigated the dependence between macroeconomic variables and the stock price index in Tehran Stock Exchange: a detailed function approach. The results of the research showed an asymmetric sequence dependence between the oil price and the stock price index. That says there is a dependence between the oil price and the stock price index in the lower banks, and the size of this dependence is different from the dependence in the upper boundaries. Moreover, there is a significant high and low sequential dependence between the inflation rate and the stock price index. This means that the stock price index is highly dependent on the inflation rate in limited amounts. The absence of dependence between the exchange rate and the stock price index in limited amounts is seen in other results of this research.

Forughi and Mirzaei [5] investigated the effect of conditional accounting conservatism on future stock price crash risk in the listed companies on the Tehran Stock Exchange. The findings of the current research showed an inverse relationship between conditional conservatism and future stock price crash risk. Moreover, the results of this research showed that conditional conservatism has a higher ability to reduce future stock price crash risk in conditions where there is information asymmetry between managers and investors.

Moradi et al. [15] have tested the relationship between conservatism and stock price crash for the level of information asymmetry. The relationship between conservatism and stock price crash in companies with a high level of information asymmetry is not statistically significant, and information asymmetry cannot increase the effect of conservatism in the stock price crash risk reduction based on the reported results.

Rahimpour [17] investigated the effect of oil price fluctuations on Iran's stock price index. The obtained results showed that an increase in oil prices signified the stock price index and increased the growth of the stock price index. In addition, the oil market shock is one of the main explanations for the fluctuations in the growth of the stock price index.

Foreign background

Hamdi et al. [2] investigated the relationship between stock price synchronicity and investment efficiency. They found a negative and significant relationship between the synchronicity of stock prices and investment efficiency.

Shih et al. [4] investigated the relationship between stock prices and their liquidity synchronicity. They found that their liquidity decreases by stock prices increase.

Paeweh and Nayeb [16] investigated the effect of the characteristics of the board of directors on stock price synchronicity. They found that the different characteristics of the board of directors have a negative and significant effect on the stock price synchronicity.

Dimitrios et al. [12] investigated the effect of accounting conservatism on the quality of accounting information and stock price crash risk. They found that conservative accounting practices reduce the quality of accounting information and increase stock price crash risk by non-reflection of facts in timely reflection of incomes and expenses.

Kim and Zhang [11] investigated the relationship between accounting conservatism and stock price crash risk in their research. The results of their research showed that conservatism limits managers' motivations for maximizing performance and not disclosing bad news. Thus, it reduces the stock price crash risk. Moreover, they proved that the ability of conservatism to reduce future stock price crash risk is higher in the presence of information asymmetry using the state of the company's product market and the composition of the company's shareholders as the effective variables on information asymmetry between managers and investors.

Hutton et al. [9] investigated the relationship between the lack of transparency in financial reporting and the risk of a stock price crash in their research. They concluded that lack of transparency of financial information is related to the disclosure of less information by profit management as a measure of lack of transparency of financial information. In addition, companies that have non-transparent financial statements are more exposed to the risk of stock price crashes.

Research hypotheses

Research hypothesis: The effect of growth stock price and value stock price behavior is different on stock price crash risk.

Research model

The following regression model is used to test the research hypotheses.

$$CRASH_{it} = \beta_0 + \beta_1 GPSV_{it} + \beta_2 VPSV_{it} + \beta_3 BETA_{it} + \beta_4 SIZE_{it} + \beta_5 INDUSTRY + \epsilon_{it}$$

Research variables

Stock price crash risk

The dependent variable of this research is future stock price crash risk. Hutton et al. (2009) [9] model was used to measure the mentioned variable.

Based on this research, the crash period in a certain financial year is when the specific monthly return of a company is $2/3$ standard deviations lower than the average specific monthly return. The basis of this definition is based on the statistical concept that the fluctuations that fall between the average plus $2/3$ standard deviations and the average minus $2/3$ standard deviations are considered normal fluctuations and other fluctuations are considered abnormal by this assumption that the normality of the statistical distribution of a specific monthly return of a company. Considering that the future stock price crash is an abnormal fluctuation, the number $2/3$ is considered as the boundary between normal and abnormal fluctuations. Therefore, future stock price crash risk is defined as a virtual variable in this research. In this way as if the company has experienced at least one crash period by the end of the financial year, will take a score of one, and otherwise, will take a score of zero. Monthly stock returns can be calculated by the following equation:

$$W_{in} = LN(1 + e_{in})$$

In which, W_{in} : the specific monthly return of company i in month t during the financial year, and e_{in} : the return of the residual shares of company i in month t and is the residual of the regression model of the following model:

$$r_{it} = b_0 + b_{1i} * rm_{t-2} + b_{2i} * rm_{t-1} + b_{3i} * rm_t + b_{4i} * rm_{t+1} + b_{5i} * rm_{t+2} + e_{it}$$

In which, r_{it} : the return on the residual stock of company i in month t of the financial year, and r_{mt} : The return of the market in month t is calculated by subtracting the index at the beginning of the month from the index at the end of the month and dividing the result by the index at the beginning of the month. The specific monthly return of the company will be the basis of action to measure the future stock price crash risk.

Growth stock price fluctuation

First, we mention the growth stock identification criteria:

- * Don't share profits.
- * Market value to its book value should be higher than the market average,
- * The income yield (income relative to the price) should be lower than the market average.

Later, the growth stock price fluctuation can be calculated by the following equation:

$$GPSV = \frac{\text{growth stock price the beginning of the year} - \text{growth stock price at the end of the year}}{\text{growth stock price the beginning of the year}}$$

Value stock price fluctuation

First, we mention the value stock identification criteria:

- * Don't share profits.
- * Market value to its book value should be higher than the market average,
- * The income yield (income relative to the price) should be lower than the market average.

Later, the value stock price fluctuation can be calculated by the following equation:

$$VPSV = \frac{\text{value stock price the beginning of the year} - \text{value stock price at the end of the year}}{\text{value stock price the beginning of the year}}$$

Beta risk

Beta risk will be calculated based on the stock fluctuation than the market fluctuations in 90 days.

Company's size

The company's size can be calculated by the natural logarithm of the company's assets balance at the end of the financial year.

Industry factor

The mentioned variable is defined as a dichotomous variable. In this way, if the company's stock has been traded in one year, the score will be one; otherwise, the zero score will be the basis of the calculations.

Research methodology

The methodology of this research is descriptive correlation, and its design is experimental with a post-event approach. Therefore, the research hypotheses will be tested using multivariate linear regression which is based on panel data and a combination of cross-sectional and time series. In addition, we will investigate the effect of the independent variable on the dependent variable by statistical and econometric methods. Meanwhile, the librarian method was used to collect the required data to prove the research hypotheses by studying the financial statements of the companies in the statistical population and was extracted from the listed financial statements in the databases and the website of the Tehran Stock Exchange Organization. Furthermore, SPSS (ver. 22) and Eviews software types will be used to analyze data.

A complete description of the data collection method

The research is of post-event design (using old data) and is practical in terms of purpose. The librarian method will be used to collect research literature. The required data will be collected through the publishers' comprehensive information system (Codal.ir) and the stock exchange technology management company (Tsetmc.com).

Statistical population, sampling method, and sample volume

The statistical population of this research is the listed companies in the Tehran Stock Exchange from the beginning of 2013 to the end of 2022 for ten years, and a systematic elimination method was used to take the desired statistical sample. Therefore, the statistical population has been adjusted using the following conditions and restrictions:

1. The sample companies have continued their membership in the stock exchange during these ten years.
2. Sample companies should have a financial year ending on the last day of winter.
3. The data of research variables should be accessible to the sample companies.
4. The sample companies have not changed their financial year during the review period.
5. The sample companies should not include banks and other financial institutions, investment, brokerage, holding, and insurance companies.

All the listed companies in Tehran Stok Exchange since the beginning to the end of 2022	498
Companies should have a financial year ending on the last day of winter.	81
Companies that did not keep their 10-year membership in the stock exchange	88
Companies whose financial data was not sufficient to evaluate the variables	80
Companies who changed their financial year in the studied period	74
Companies that were not banks and other financial institutions, investment, brokerage, holding, and insurance companies.	77
Whole companies which were not competent of sampling conditions	(400)
Statistical sample	98

Findings

Studying the reliability of the research variables

Reliability means that the mean and variance of the variables over time, and their covariance have been constant in different years. Therefore, the test of Levin, Lin, and Chu’s test was used and its results are shown in Table 1. The statistical distribution of the test is as follows:

H0: data is not reliable.

H1: data is reliable.

Table 1: results of the reliability test for the research variable

Variable	Symbol	Levin, Li, and Chu’s test	The probability of Levin, Li, and Chu’s test
stock price crash risk	CRASH	-10.655	0.0000
growth stock price fluctuation	GPSV	-10.218	0.0000
value stock price fluctuation	VPSV	-11.400	0.0000
Beta risk	BETA	-10.655	0.0000
Company’s size	SIZE	-12.965	0.0000
Industry factor	INSUSTRY	-16.085	0.0000

According to the obtained results, it was concluded that the research variable in the studied period was reliable because the probability of Levin, Li, and Chu’s test was less than a 5

Normality test of error clauses in the model of research hypotheses

It is essential to ensure the normality of the data before assuming that the statistical tests explain the correct results. For this purpose, the Jarque-Bera test was used in the Eviews software to test the normality of the data. The statistical distribution of the test is as follows:

H0: error clauses in the model of research hypotheses have a normal distribution

H1: error clauses in the model of research hypotheses do not have a normal distribution.

The test results are shown in Table 2.

Table 2: results of the normality of error clauses in the model of research hypotheses

model	Symbol	Jarque-Bera test	Sig. level
The model residual of all hypotheses	RESISUAL01	12.016	0.080

Since the probability value of the Jarque-Bera test is higher than the 5% error level, it can be concluded that the error clauses of the research hypothesis model have a normal distribution.

Studying the collinearity of all independent and control variables of research

The results of the collinearity analysis between the independent and control variables of the research are shown in Table 3. If the tolerance is less than 0.2 or the value of the variance inflation factor is not in the range of 1-5, it can be concluded that collinearity is probable.

Table 3: results of the normality of error clauses in the model of research hypotheses

Independent and control variables		Collinearity tests	
Variable	Symbol	Tolerance	variance inflation factor
stock price crash risk	GPSV	0.486	2.068
growth stock price fluctuation	VPSV	0.555	2.045
value stock price fluctuation	BETA	0.491	2.037
Beta risk	SIZE	0.507	2.048
Company's size	INSUSTRY	0.485	2.064

Since the tolerance values in all variables are higher than 0.2, the variance inflation value is less than 5. Therefore, it is concluded that collinearity does not exist among the mentioned variables.

Heterogeneity variance test

White's test was used to detect the variance of heterogeneity in this study, and the results are shown in Table 4. The statistical distribution of the test is as follows:

H0: variance homogeneity

H1: variance heterogeneity

Table 4: results of studying heterogeneity variance

test	hypothesis	White's test	Degree of freedom	Probability of White's test
White	All hypotheses	2.269	(3.157)	0.0741

The obtained results indicate that the probability value of the mentioned test is higher than the error level of 5%. Thus, it shows the variance homogeneity, and no problem was observed for variance heterogeneity.

Chow and Hausman test

The proper regression model has been selected before testing the research hypotheses. In the first step, the consolidated data model against panel data was selected using Chow's test. The related assumptions to this test are explained as follows:

H0: consolidated data is accepted

H1: panel data is accepted

The results of this test are shown in Table 5.

Table 5: selecting the panel data model against consolidated data in the research hypothesis

test	hypothesis	F Limer test	Degree of freedom	Probability of F Limer test
F Limer	All hypotheses	12.424	(122.485)	0.0000

According to the data in Table 5, the probability value of Chow's test is less than the error level of 0.05. Therefore, the appropriate model for the research hypotheses is to use the panel data method. Hausman test has been used for the selection of the panel data model against pooled data to select the fixed effects model against the random model. The relevant assumptions to this test are explained as follows:

H0: using the random effect method

H1: using the fixed effect method

The results of the mentioned test are shown in Table 6.

As it is observed, the probability value of the Hausman test is less than 5

Research hypothesis test

The regression model of the fixed effects of the mentioned hypothesis is shown in Table 7.

Table 6: selecting the fixed effects model against the random effect model in the research hypotheses

Test	Hypothesis	Hausman test	Degree of freedom	Probability of Hausman test
Hausman	All hypotheses	37.024	7	0.0000

Table 7: the regression model of the fixed effects of research hypotheses

tests Variable	Symbols	Regression coefficients	T-value	Probability of T-value
Constant value	C	6.919	0.592	0.2412
growth stock price fluctuations	GPSV	32.497	3.970	0.0119
value growth stock price fluctuations	VPSV	2.902	3.399	0.0000
Beta risk	BETA	-1.431	-0.477	0.1833
Company's size	SIZE	1.496	1.152	0.7094
Industry factor	INSUSTRY	0.198	0.435	0.0000
determination coefficient	Adjusted determination coefficient	Durbon-Watson	F- value	Probability of F-value
0.869	0.861	1.985	21.005	0.0000

According to Table 7, we found that: Growth stock price fluctuation has a positive and significant effect on stock price crash risk because although the sign of the regression coefficient (32.497) is positive, its significance level (0.0119) is less than the 5

Table 8: results of paired t-test

Independent variable	Regression coefficients	Paired t-test	Degree of freedom	Probability of paired t-test
Growth stock price fluctuations	32.497	10.596	(89.3)	0.0000
Value stock price fluctuations	2.902			

It is concluded based on the paired t-test that the effect of price behavior of growth stock price behavior and value stock price behavior is different on stock price crash risk, and the effect of a growth stock is significantly higher than the effect of value stocks () because firstly, its regression coefficient is higher (32.497 > 2.902), and secondly, the possibility of paired t-statistics (0.0000) is less than the 5% error level, which shows that the findings are aligned with the research hypothesis and confirm it.

Discussion and conclusion

The hypothesis of this research tries to answer this question, whether the effect of growth stock price behavior is different from value stock price behavior on stock price crash risk. The fixed effects regression model was used based on the results of Chow and Hausman tests to test the mentioned hypothesis whose results are briefly explained as follows: The obtained results by testing the first hypothesis of the research showed that the effect of growth stock price behavior is different from value stock price behavior on stock price crash risk. This effect is relatively strong according to the adjusted coefficient of determination (0.86) and significant according to the probability of the t-test (0.0000).

The first hypothesis of the research was confirmed based on the significance of this effect as these findings are aligned with the findings of Fulkinshitin et al. [6].

Analysis of findings

Managers are motivated to hide part of the losses to keep their jobs in the absence of full transparency in the quality of the information in the financial reporting process. This process means not disclosing real losses and continues until the presence of the manager in the company. After the manager left the company, a huge amount of undisclosed losses entered the market which leads to a stock price crash. In addition, investors in a non-transparent reporting environment are not able to identify and discover the loss-making projects of the company. The disability of investors to distinguish between profitable and unprofitable projects in their initial steps makes unprofitable projects continue and their losses increase over time. The negative returns of these types of projects are accumulated within the company over time. In addition, the stock price will significantly reduce when the information about them is disclosed. Therefore, managers and investors face a kind of uncertainty regarding accounting information which can influence users' decisions and, as a result, stock prices. One of the important cases for the growth and development of the capital market is to make the relevant public knowledge to the process of determining securities prices which include stocks, the effective factors on the price and volume of stock transactions, and the interpretation of important events such as the announcement of a capital increase by offering new stocks. Share offering makes more shares accessible for shareholders and the volume of exchanges increases. The volume of exchanges can also be used as important and valuable data in investment decisions and provide useful information to decision-makers and investors according to the current situation and the outlook of

the price. Companies with a higher volume of transactions than other companies, due to their higher liquidity, will have a lower relevant risk to the impossibility of selling shares in the market. Stock prices often reflect the market's expectations about the economic position of companies. Therefore, the market indexes show the future state and performance of the entire economy. Securities analysts, portfolio managers, and other economic operators use market indexes to examine the effective variables on the overall movement of stock prices. In addition, the investment returns of this market can be compared with other capital opportunities such as investing in bonds, gold, and currency by examining the movement of the stock market. The stock price is impressed by market conditions every day. The stock price is determined by market supply and demand. If the shareholders are interested in purchasing a particular stock, the demand will get higher than the supply and the prices will increase, and if the shareholders are interested in selling a particular stock, the supply will get higher than the demand and we will see the price decrease. Analyzing and understanding supply and demand is easy, but identifying what factors made the shareholders show interest in a stock is important. However, this stock was not of interest previously. Many factors can be stated to answer this question which is the positive and negative announcements and news about the company's shares which can be about the company's management, financial ratios, and other things. Of course, it should be noted that each shareholder has its ideas and strategies. In theory, stock price volatility reflects how investors feel about a company's value. Of course, it cannot be said that a company with more expensive shares is more valuable or vice versa. We must consider the total value of the company's shares. An efficient capital market is a complex one where there are complex financial instruments. As observed, one of the characteristics of an efficient market is that the stock price is adjusted quickly and the behavior of the market is subject to a random step. The center of gravity of empirical tests is the speed of price adjustment with new information. On the contrary, shareholders and investors need to identify major variables that explain the simultaneity of stock prices. Being aware of the variables and reaching the appropriate model can develop their investment. The goal of every wise and economic person is to get higher and higher returns, and on the other hand, technical analysis in the form of specialized terms and special rules tries to predict the direction and even size of the price movement of securities in the future. However, the fundamental solution relies on the relationships between variables and makes predictions possible through the degree of correlation and cause-and-effect relationship between them. Higher returns and profits can be obtained using these two analytical tools. Using past and present financial data of companies is considered in the fundamental analysis of stocks. Suggestions based on the research findings

The obtained results confirmed the 3 hypotheses:

- It is suggested to investors to invest by separating growth and value stocks based on their risk tolerance.
- It is suggested to investors and stock market participants have financial and investment activities in companies that have high growth stock and value stock in addition to rating the target companies based on the amount of growth stock and value because the risk of a stock crash is at a low level in such units.
- Furthermore, investors can measure and investigate the behavior of growth stock and value stock in the financial crisis by comparing the benefits of these two stocks.

Suggestions for further researchers

- Investigating the moderating role of the financial crisis in moderating the relationship between growth stock price and value stock price with stock price crash risk.
- Investigating the moderating role of corporate governance in moderating the relationship between growth stock price and value stock price with stock price crash risk.
- Investigating the moderating role of profit smoothing in moderating the relationship between growth stock price and value stock price with stock price crash risk.
- Investigating the relationship between growth stock price and value stock price with stock price crash risk in Over-the-counter (OTC) companies.
- Investigating the relationship between growth stock price and value stock price with stock price crash risk in loss-making companies.
- Investigating the relationship between growth stock price and value stock price with stock price crash risk in bankrupt companies.
- Investigating the relationship between growth stock price and value stock price with stock price crash risk in family-owned companies.

References

- [1] M. Asadi, *Studying the relationship between the quality of accounting information, the delay in stock price adjustment, and the ability to predict future stock returns*, MA thesis, Islamic Azad University, Kermanshah Branch - Faculty of Humanities, 2014.
- [2] H. Ben-Nasr and A.A. Alshwer, *Does stock price informativeness affect labor investment efficiency?*, *J. Corporate Finance* **38** (2016), 249–271.
- [3] R. Fattahi, *Investigating the effect of accounting conservatism on the stock price crash risk of companies listed on the Tehran Stock Exchange*, Master's thesis. Payame Noor University, Behshahr Center, 2016.
- [4] Sh.-P. Feng, M.-W. Hung, and Y.-H. Wang, *The importance of stock liquidity on option pricing*, *Inte. Rev. Econ. Finance* **43** (2016), 457–467.
- [5] D. Forughi and M. Mirzaei, *the effect of conditional accounting conservatism on future stock price crash risk in Tehran Stock Exchange companies*, (2012).
- [6] M. Fulkinshitin, B. Sony, and S. Bhaduri, *Information asymmetry and financing choice between debt, equity and dual issues by Indian firms*, *Int. Rev. Econ. Finance* **72** (2017), 90–101.
- [7] Arab Haji, *Investigating the relationship between profit management and the risk of stock price crash in listed companies on the Tehran Stock Exchange*, Master's thesis, Islamic Azad University, Shahroud Branch - Faculty of Literature and Human Sciences, 2014.
- [8] H. Hong and J.C. Stein, *Differences of opinion, short-sales constraints, and market crashes*, *Rev. Financ. Stud.* **16** (2003), no. 2, 487–525.
- [9] A.P. Hutton, A.J. Marcus, and H. Tehranian, *Opaque financial reports, R2, and crash risk*, *J. Financ. Econ.* **94** (2009), no. 1, 67–86.
- [10] A. Kargarbarzi, *investigating the dependence between macroeconomic variables and stock price index in Tehran Stock Exchange: detailed function approach*, Master's thesis, Shahid Chamran University of Ahvaz - Faculty of Economics and Social Sciences, 2013.
- [11] J.B. Kim and L. Zhang, *Does accounting conservatism reduce stock price crash risk? firm-level evidence*, 35th EAA Ann. Cong., 2012.
- [12] D.V. Kousenidis, A.C. Ladas, and C.I. Negakis, *Accounting conservatism quality of accounting information and crash risk of stock prices*, *J. Econ. Asymmet.* **11** (2014), 120–137.
- [13] A. Mehri, *Stock price prediction by gmdh type neural network (case study: food and beverage industries of tehran stock exchange)*, MA thesis, Koshiar Institute of Higher Education - Faculty of Management, 2014.
- [14] M.B. Mirzaei, *Uncertainty of information and reducing the risk of stock price crash*, Master's Thesis in Accounting, Islamic Azad University, Arak Branch, Faculty of Management, Accounting Department, 2016.
- [15] J. Moradi, H. Valipour, and M. Ghalami, *the effect of accounting conservatism on reducing the risk of stock price crash*, **4** (2011).
- [16] H. Pew Tan, D. Plowman, and P. Hancock, *Intellectual capital and financial returns of companies*, *J. Intellect. Capital* **8** (2007), no. 1, 76–95.
- [17] H. Rahimpour, *investigating the impact of oil price fluctuations on the stock price index in Iran*, MA thesis, Tabriz University - Faculty of Literature and Human Sciences, 2010.