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The impact of earning classification changes on stock price crash risk

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Abstract: Previous studies suggest that changing the classification of earnings can have significant effects on a company's long-term performance. Investors and shareholders rank the possibility of greater loss as the primary source of investment risk and decision-making. This implies that the risk of stock price crash is one of the factors that cause concern and is sensitive for investors and shareholders. Considering the above, this study seeks to investigate the effect of changing the classification of earnings on the risk of stock price crash. In this study, 167 companies listed on the Tehran Stock Exchange during the period 2014-2023 were studied. To test the hypotheses, a logistic regression model was used. The research findings show that earning reclassification has a positive and significant effect on the risk of stock price crash, but company size has a negative and significant effect on the relationship between earning reclassification and stock price crash risk.

Keywords: Earning reclassification, stock price crash risk, company size

Introduction

Amid the stock market turmoil in recent years, investors have considered “stock price Crash” as one of the most dangerous factors (Chen et al., 2001). Callen and Fang (2015) define the stock price crash risk literature as negative asymmetry in the distribution of stock returns, while previous studies point to several theoretical drivers based on “random risks”, such as informational blockage (Cao et al., 2002), heterogeneity in investor beliefs (Hong and Stein, 2003), and incentives for managers’ compensation such as management bonuses (Bleck and Liu, 2007; Benmelech et al., 2010; Kim et al., 2011). It is worth noting that the aforementioned theoretical link has been proposed in the research of Jin and Myers (2006) as a theoretical framework of agency theory, with the content that information asymmetry allows managers to store bad news for a certain period. In this regard, managers seek to suddenly release bad news in the market, which in turn leads to a sharp and continuous Crash in stock prices and, as a result, its Crash (Kim et al., 2014). Along with the theoretical framework of agency theory, existing empirical studies consider the lack of transparency of a company's financial reporting as one of the determining factors of stock price Crash risk. Hutton et al. (2009) point to accruals management as an example of opportunistic financial reporting related to stock price Crash risk. In this regard, considering the role that types of earnings management, including earnings reclassification, can have on stock price Crash risk. Considering the above discussions and the role that earnings reclassification can have on stock price crash risk. In order to clarify the issue, this study continues to state the problem, research background, hypotheses, findings, and finally conclusions and research suggestions**.**

Statement of the problem and research background

Statement of the Problem and Research Background Francis et al. (2016) show that a company that engages in "real earnings management" is prone to stock price crash risk. Cohen et al. (2014) focused on the banking industry and found that banks and financial and credit institutions suffered from and were exposed to stock price crash risk in using discretionary accruals to hide facility losses during the financial crisis. In addition, Hsiu et al. (2022) found that stock price crash risk is positively related to reports that deviate from "GAAP", which is considered a form of earnings management. On the other hand, research attributes crash risk to the role of corporate governance in reducing information asymmetry between insiders and outsiders. Andreou et al. (2016) show that strong internal governance policies, such as an audit committee with a high percentage of independent members and expertise in the client's industry, lead to a reduction in stock price crash risk. As another channel of internal governance, Al-Mamun et al. (2021) provide evidence that companies with experienced financial advisors have lower risk of crash than other companies. Jin and Myers (2006) show that the existence of information asymmetry between company insiders and external stakeholders leads to the risk of stock price crash. In this regard, "earnings reclassification" exacerbates the possibility of information asymmetry because it is more difficult for stakeholders and external auditors to detect reclassification when managers use it as a means of earnings management (Gu and Chen, 2004).

Reclassification was first introduced by McVay in 2006. He considered this type of manipulation of accounts as a new method of earnings management and acknowledged its importance. He examined reclassification through the difference between basic earnings (revenue minus cost of goods sold and administrative expenses) and exceptional earnings and losses. He showed that companies overstate their underlying earnings by shifting between income statement items. Fun et al. (2010) also observed and reported evidence of companies' opportunism in reclassification. Their research results showed that companies are more likely to use this method when faced with limitations in using accruals. Abertati et al. (2014) also concluded by examining the limitations of other earnings management methods that companies use reclassification methods to achieve their goals when the costs of using other earnings management methods are high. There are also several studies that show that there is a trade-off between different earnings management methods (Ewert and Wagenhofer, 2005; Cohen et al., 2014; Bedrescher, 2011 and Zhang, 2012). In order to overstate the main earning, managers try to transfer costs to lower categories, meaning that they will transfer as much of the cost of goods sold as possible to non-operating costs and non-recurring items, and in the same way, they will try to identify part of the operating costs as selling and administrative costs or non-recurring items, or to identify and record part of the selling and financial administrative costs as non-recurring items. Perhaps one of the main reasons for this can be found in the fact that accounting knowledge and the focus of experts in this field have been more on the method of identification and less on the method of classification. In addition, there are no clear boundaries for the method of reflecting financial data, and therefore it has remained out of the sight of internal and independent observers (Sagafi and Jamalianpour, 2018). Bradshaw and Sloan (2002) show that the components of earning do not equally reflect the economic Profitability of the company. While some components arise from a firm's core operations and are therefore relatively more permanent, others relate to the firm's non-operating activities and are driven by transient shocks. Accordingly, market participants react differently to operating and non-operating earnings. Lipe (1986) shows that operating earnings are typically the primary driver of higher valuations than non-operating earnings. Kinney and Trezevant (1997) show that market participants tend to assign greater weight to operating earnings than to non-GAAP earnings. In addition to different market reactions to core versus non-operating earnings, managers may have different incentives to report core earnings. In particular, previous studies show that most compensation (bonus) programs are directly linked to operating earnings (rather than non-GAAP earnings) (Adut et al., 2003). In determining the "reward components" Baber et al. (1998) show that the weight of specific items is always lower (due to low permanence).

Piergiotakis et al (2024) In a study, they examined the relationship between high-frequency trading and stock price downside risk. Using attention difference analysis, they found that stock price downside risk increases by more than 80% in the presence of high-frequency trading (HFT). Notably, the positive effect of HFT on downside risk is more pronounced in larger firms. Our results survive a series of robustness tests, including propensity score matching and placebo tests. Channel analysis suggests that HFT increases liquidity and makes stock prices noisier and less informative, which exacerbates investor disagreement and encourages bad news speculation. Finally, the effect of HFT is moderated in countries with developed derivatives markets, for firms with higher analyst coverage, and in collectivist or religious societies. Giman et al. (2023) examined the effect of earnings reclassification on stock price downside risk. Their research findings showed that reclassification is positively associated with the risk of future stock price crash, even if the final net earning remains unchanged. Also, the positive relationship observed between reclassification and stock price crash risk is due to opportunistic behaviors of managers.

Andreu et al. (2023) believe that with the increase in the crash in the price of specific stocks of companies from 5.5% to 27% between 1950 and 2018, most of the literature in this field has attributed the crash in stock prices to

agency problems such as hiding bad news (financial transparency reporting) by managers and overinvestment. However, agency problems are not sufficiently able to explain the increasing frequency of stock price Crash. Habib et al. (2021) studied the effect of financial statement comparability on the smoothing behavior of banks' earnings through loan loss provisions. Based on a sample of 628 US banks (4683 bank-year observations) for the period 1999-2013, they found that comparability of financial statements limits earning smoothing through loan loss provisioning. They also showed that this limiting effect was more pronounced for larger banks and during the global financial crisis (GFC). Kim et al. (2018) in a study examining the relationship between CEO losses and stock price crash risk showed that CEOs generally lead to losses due to their opportunistic behaviors such as information asymmetry, overconfidence, and failure to publish adverse news, all of which have a positive effect on the risk of future stock price Crash.

Kim and Zhang (2016) in a study titled "The Relationship between Investment Efficiency and Stock Price Crash Risk with Emphasis on Information Asymmetry" examined the relationship between the aforementioned variables. The results of the first hypothesis of their study showed that there is a positive relationship between investment inefficiency and stock price crash risk. Also, in their study, the sample companies were categorized by product market competition index and advertising cost. Companies with low competition and high advertising cost indicate high information asymmetry. The results of the second hypothesis of their study showed that the positive relationship between investment inefficiency and the risk of stock price crash is stronger in companies with high information asymmetry than in companies with low information asymmetry. Sen (2016) studied the effect of comparability of companies' financial statements on accrual-based earnings management and real earnings management. The results of this study showed that companies with more comparability of financial statements increased real earnings management and reduced accrual-based earnings management. Fun et al. (2010) in a study titled Earnings Management Using Reclassification of Operating Expenses to Non-Operating and Specific Expenses concluded that managers have more incentive to reclassify operating expenses to non-operating expenses in the middle of the fourth fiscal period and in the middle of fiscal periods when their ability to manipulate accruals is more limited. Jelink (2007) examined earnings management by reclassifying operating expenses to specific revenue-reducing items. He concluded in his research that managers do not have an incentive to report earnings lower than analysts' forecasts due to managerial biases, and they opportunistically manage operating earnings in their desired direction by reclassifying operating expenses to specific revenue-reducing items.

Research Method

The present study is considered an applied research in terms of its purpose. The purpose of applied research is to develop applied knowledge in a specific field. In other words, applied research is directed towards the practical application of knowledge. Also, in terms of the method of data collection, this research is descriptive (because it leads to a greater understanding of existing conditions and helps in the decision-making process) and correlational. Because it examines the degree of dependence of the dependent variable and the independent variable on each other. The research method is inductive in which the theoretical foundations and research background are collected through the library, articles and the Internet, and inductive reasoning is used to generalize the results in rejecting or proving the research hypothesis by using appropriate statistical methods. In this study, data will be used in the form of year-company to test the hypothesis.

Research Statistical population

The statistical population of the study includes all companies listed on the Tehran Stock Exchange and the OTC market, for which the following adjustments have been made for its selection. 1- The companies' fiscal year ends at the end of March; 2- During the time frame of the research, they have not stopped their activities and have not changed their fiscal period; 3- Due to information limitations, they are not part of the over-the-counter primary market companies; 4- They are not part of investment (holding) and financial intermediation (leasing and banking) and insurance companies; 5- During the time frame of the research, there has been no trading break of more than six months and their information is available for at least one year. After applying the above adjustments, 167 companies were included in the statistical population of this research. The time frame of the research is 10 fiscal periods (from 2014 to 2023) and 1670 company years. It should be noted that the data was collected using the new Rahavard software and the information published by the companies on the KODAL network and the Stock Exchange Organization's transaction archive.

Research Hypotheses

Based on the theoretical foundations mentioned, the research hypotheses are as follows:

Hypothesis (1): Change in earnings classification affects the risk of stock price crash.

Hypothesis (2): Company size affects the relationship between change in earnings classification and stock price crash risk.

Research variables and their operational definitions

Given that this study examines the effect of change in earnings classification on stock price crash risk, the hypothesis model is presented based on the research of Giman et al. (2023) as follows:

Test model for main hypothesis (1):

$$CR_{it} = \beta_0 + \beta_1 ECS_{it} + \beta_2 MB_{it} + \beta_3 CFO_{it} + \beta_4 \Delta SALE_{it} + \beta_5 DIV_{it} + \beta_6 LOSS_{it} + \beta_7 SRD_{it} + \beta_8 BR_{it} + \beta_9 IP_{it} + \beta_{10} Q\text{-}TOBIN_{it} + \varepsilon_{it}$$

Test model for main hypothesis (2):

$$CR_{it} = \beta_0 + \beta_1 ECS_{it} + \beta_2 SIZE_{it} + \beta_3 SIZE * ECS_{it} + \beta_4 MB_{it} + \beta_5 CFO_{it} + \beta_6 \Delta SALE_{it} + \beta_7 DIV_{it} + \beta_8 LOSS_{it} + \beta_9 SRD_{it} + \beta_{10} BR_{it} + \beta_{11} IP_{it} + \beta_{12} Q\text{-}TOBIN_{it} + \varepsilon_{it}$$

Table 1. Symbols of research variables

Variable name	Symbol	Variable name	Symbol
stock price crash risk	CR	Company Loss	LOSS
earning classification changes	ECS	Stock Return Deviation	SRD
Market-to-book ratio	MB	Bankruptcy Risk	BR
Operating cash flow	CFO	Industry Performance	IP
Sales change percentage	ΔSALE	Company Value	Q-TOBIN
Earnings per share	DIV	Company Size	SIZE

The following is the method of measuring each of the research variables:

How to calculate the change in earning classification

In this study, the McVey (2006) model is used to calculate the change in earning classification. It should be noted that Saghafi and Jamalianpour (2018) also used the same model in their research. The operational definition of the model is presented below. To measure the change in earning classification, the amount of unexpected principal earning Ɛt and the changes in unexpected principal earning Vt are used. For this purpose, related models are used to estimate the amount of expected principal earning and changes in it:

Relationship No (1).

$$CE_t = \beta_0 + \beta_1 CE_{t-1} + \beta_2 ATO_t + \beta_3 ACC_{t-1} + \beta_4 ACC_t + \beta_5 \Delta SALE_t + \beta_6 NEG\_\Delta SALE_t + \varepsilon_t$$

Relationship No (2).

$$\Delta CE_t = \lambda_0 + \lambda_1 CE_{t-1} + \lambda_2 \Delta CE_{t-1} + \lambda_3 \Delta ATO_t + \lambda_4 ACC_{t-1} + \lambda_5 ACC_t + \lambda_6 \Delta SALE_t + \lambda_7 NEG\_\Delta SALE_t + \nu_t$$

All equations related to measuring the level of classification change are fitted at the level of "market industry category" and the remaining terms are considered as the amount of classification change. It should be noted that after obtaining the remaining terms, we encounter positive and negative values. Accordingly, the higher the residual value of the model, the greater the "earning classification change" and vice versa. The variables used in the above equations are as follows.

Table 2. Variables used in earning classification change models

Row	variable symbol	definition
1	CEt	Core earning, which is net income minus cost of goods sold minus general, selling, and administrative expenses divided by net income
2	ΔCEt	Changes in core earning, which is CEt+1– CEt
3	UE_CEt	Extraordinary core earning or loss (residual from the first equation)
4	UE_ΔCEt	Changes in extraordinary core earning or loss (residual from the second equation)
5	ATO	Net operating asset turnover ratio, where net operating assets are the sum of operating assets minus operating liabilities. Operating assets are equal to total assets minus cash and short-term investments. Operating liabilities are equal to total assets minus total liabilities minus the book value of common and preferred stock and minority interests.
6	ACC	Operating accruals are equal to operating earning or loss minus net operating cash flow.
7	ΔSALE	Percentage change in revenue from the previous period.
8	NEG_ΔSALE	Percentage decrease in revenue, or zero if there is no decrease.

How to calculate stock price Crash risk

In this study, stock price crash risk is the dependent variable, which is measured using the Hutton et al. (2009) model. According to the study by Hutton et al. (2009), the crash period in a given fiscal year is the period during which the company's specific monthly return is 3/2 standard deviations lower than its average specific monthly return. The basis of this definition is the statistical concept that, assuming the normal distribution of the company's specific monthly return, fluctuations that fall within the range of the mean plus 3/2 standard deviations and the mean minus 3/2 standard deviations are considered normal fluctuations, and fluctuations outside this range are considered abnormal. Given that stock price crash is an abnormal fluctuation, the number 3/2 is considered the boundary between normal and abnormal fluctuations.

According to the model of Hutton et al. (2009), the risk of stock price crash is a dummy variable that is considered to be one if the company has experienced at least one crash period during the fiscal year and zero otherwise.

The specific monthly return of the company is calculated using the following equation.

$$W_{j,\theta} = Ln(1+\varepsilon_{j,\theta})$$

In the above equation, $W_{j,\theta}$ is the specific monthly return of company j in month θ during the fiscal year and $\varepsilon_{j,\theta}$ is the residual return of company j stock in month. and the following equation is obtained from the residual of the regression model.

$$r_{j,\theta} = \beta_0 + \beta_1(r_{m,\theta-2}) + \beta_2(r_{m,\theta-1}) + \beta_3(r_{m,\theta}) + \beta_4(r_{m,\theta+1}) + \beta_5(r_{m,\theta+2}) + \varepsilon_{i,\theta}$$

In the above regression relationship $r_{j,\theta}$ the company's stock return j in month θ during the fiscal year; $r_{m,\theta}$ is the market return in month θ . The growth rate of the market index in each month is used to calculate the monthly market return. The regression model is fitted using multivariate linear regression and the mixed data method.

How to calculate company size

This variable is measured based on the natural logarithm of total assets. To make the variable virtual, first the variable is sorted from the lowest value to the highest value and the number 1 (one) is considered for above the median and the number 0 (zero) is considered for below the median. Year- above-median companies are considered as large companies and year- below-median companies are considered as small companies.

Control variables

The control variables of the research based on the research of Zang et al. (2014) are as follows:

Market-to-book ratio: This variable is measured through the ratio of stock market value to book value.

Operating cash flow: This variable is measured from the natural logarithm of operating cash flows.

Percentage change in sales: This variable is obtained based on the changes in sales of the current and previous year divided by the sales of the previous year.

Earnings per share: This variable is measured through the ratio of dividends to earnings per share.

Loss-making of the company: If the observation in the year- the company in question is loss-making, the dummy variable is 1, otherwise the dummy variable is 0.

Deviation of stock returns: To calculate this variable, the standard deviation of the company's monthly stock returns is used.

Bankruptcy risk: Bankruptcy risk has been a common phenomenon throughout the economic life of countries, which often coincides with the financial crisis of companies. In this regard, the accuracy of bankruptcy risk models is almost close to each other, so the average T-score-A model is selected as the Altman adjusted model based on the Iranian economic environment (which has been localized) as the bankruptcy risk variable.

$$\text{T-score A} = 0.291(WC/TA) + 2.458\ (RE/TA) - 0.301(EBIT/TA) - 0.079\ (BVE/TL) - 0.05(TS/TA)$$

Accordingly, the limits of the modified Altman model, according to the application of different stages of bankruptcy risk (Altman), according to the research of Kordestani et al. (2014), are as follows (Falah, 2021):

Table 3. Bankruptcy Probability Categories

Row	Range Z	Bankruptcy Probability
1	$T \leq -0.14$	The probability of the company's bankruptcy risk is very high (95 percent).
2	$-0.14 < T < 0.2$	The company is in the stage of complete bankruptcy risk.
3	$0.02 < T < 0.36$	The company is in the stage of cash deficit and inability to pay financial or commercial debts.
4	$0.36 < T < 0.6$	The company is in the stage of latent bankruptcy risk.
5	$T \geq 0.6$	The company has financial health.

Industry Performance: To calculate the industry effect, the research of Bari et al. (2019) and Lu et al. (2020) is used. In general, the average return on assets for each industry is used to calculate this variable.

Firm Value: To calculate the value of the firm, the Tobin Q ratio is used. This variable is obtained from the sum of the market value of equity and the book value of total liabilities divided by the book value of total assets (Swarnapali and Lee, 2018).

Research Findings

In general, the research findings are divided into two parts: descriptive and inferential statistics, which are presented as follows.

Descriptive Statistics of Research Variables: A summary of the descriptive statistics related to the research variables after screening and removing outliers is as follows:

Table 4. Descriptive statistics of the research variables model in the total sample

Variable	Mean	Median	Max.	Min.	STD	Skewness	kurtosis
(UE_CE)	0.000	-0.010	0.506	-0.568	0.125	0.114	5.994
(UE_DCE)	0.001	-0.010	0.696	-0.656	0124	0.429	10.011
(MB)	4.889	2.690	41.172	-4.811	6.747	3.386	16.421
(CFO)	0.127	0.106	0.740	-0.460	0.144	0.619	4.959
(D_SALE)	0.288	0.184	6.594	-0.909	0.511	4.153	38.833
(DIV)	0.849	0.489	10.767	0.000	1.554	4.468	25.980
(SRD)	1.458	1.288	5.090	0.024	0.873	1.154	4.781
(IP)	0.134	0.137	0.545	-0.297	0.089	0.257	4.260
(Q)	2.788	1.673	37.018	0.623	3.658	5.622	43.669

According to Table 4, the number of observations per year-company based on balanced composite data was 1670 observations, equal to 167 companies in 10 years. According to descriptive statistics, the above indicators can be divided into central, dispersion and other indicators, where the central indicators are the mean and median indicators, dispersion indicators are the standard deviation indicators and other indicators are the maximum, minimum, skewness and kurtosis indicators. Regarding the negative skewness coefficient of some variables, it can also be said that this indicates the existence of a right-skewed and the tendency of these variables to smaller values,

and the positiveness of the kurtosis coefficients indicates that they are higher than the normal distribution and the data are concentrated around the mean. In the following, the descriptive statistics of the frequency of qualitative variables are presented as follows.

Table 5. Descriptive statistics of the frequency of qualitative research variables in the total sample

Variable	Mean
(BR)	Year - Companies without bankruptcy risk: 1485 Year - Companies with bankruptcy risk: 185
(CR)	Year - Companies without stock price crash risk: 1311 Year - Companies with stock price crash risk: 359
(LOSS)	Year – Profitability companies: 1509 Year - Loss-making companies: 161
(SIZE)	Year - Small-sized companies: 835 Year - Large-sized companies: 835

According to the descriptive statistics of the frequency of qualitative variables of the research, the average bankruptcy risk of companies shows that year- companies without bankruptcy risk are 1485 observations and year- companies with bankruptcy risk are 185 observations. The average risk of crash in stock prices of companies shows that year- companies without stock price crash risk are 1311 observations and year- companies with stock price crash risk are 359 observations. The average loss-making of companies shows that year- profitable companies are 1509 observations and year- loss-making companies are 161 observations.

Normality test of the distribution of the dependent variables of the study: In this study, the Kolmogorov-Smirnov (K-S) test is used to examine the normality of the research variables**.**

Table 6. Results of the normality test of the distribution of the dependent variable

dependent variable	Dependent variable Results of the K-S test (normality)
Stock price crash risk (CR)	**.**Given the qualitative nature of the variable, it is obvious that it is not normal

According to Table 6, the significance level of the Z statistic of the KS test for the stock price crash risk variable (as the dependent variable) due to its qualitative nature indicates that the dependent variable of the research does not have a normal distribution, therefore, non-parametric statistical methods are used to test the hypotheses.

Results of inferential statistics for testing research hypotheses

The results of inferential statistics for testing research hypotheses are as follows:

Results of testing the first hypothesis

The results of testing the first hypothesis are as shown in Tables 6 and 7.

Table 7. Model estimation results for the first hypothesis "Reclassification based on unexpected principal earning"

Variable name and symbol	Regression coefficient	Z statistic	Prob.	VIF statistic
(UE_CE)	0.418	3.251	0.001	1.469
(MB)	0.043	2.944	0.003	2.071
(CFO)	0.366	0.707	0.479	1.367
(D_SALE)	0.035	0.272	0.785	1.170
(DIV)	-0.018	-1.761	0.078	1.107
(LOSS)	0.426	2.083	0.032	1.518
(SRD)	-0.092	-1.179	0.238	1.126
(BR)	1.130	5.779	0.000	1.375
(IP)	-2.791	-3.315	0.000	1.403
(Q)	-0.035	-1.228	0.219	2.153
Constant	-1.135	-6.296	0.000	-
LR Test		114.615		
Prob.		(0.000)		
HL statistic		3.943		
Prob.		(0.862)		
Andrews Statistic		7.417		
Prob.		(0.685)		
McFadden R-SQ		0.265		

According to the results of the first hypothesis test presented in Table 7, the significance level of the LR statistic (0.000) is lower than the acceptable error level (5 percent) and the entire regression model is significant. The results of the goodness-of-fit test (HL and Andrews tests) also show that the regression model has a relatively good fit. Also, considering the low probability level (Prob.) of the Z statistic (0.000) from the acceptable error level, for the beta coefficient of 1 (independent variable), the test results show that the change in classification based on unexpected main earning (as an indicator of earning classification change) has a positive and significant effect on the risk of stock price crash. The McFadden coefficient of determination also indicates that 26.5 percent of the changes in the risk of stock price crash are explained by the variables entered in the model. Among the control variables, market-to-book value ratio, company loss-making, and bankruptcy risk have a positive effect on the risk of stock price crash, and industry performance has a negative and significant effect. Finally, with the collinearity test between the research variables, the VIF (variance inflation factor) statistic value for all variables is smaller than 5, indicating that there is no severe collinearity problem between the research variables.

Table 8. Model estimation results for the first hypothesis "Classification change based on unexpected changes in core earnings"

Variable name and symbol	Regression coefficient	Z statistic	Prob.	VIF statistic
(UE_DCE)	0.546	3.270	0.000	1.528
(MB)	0.044	2.949	0.003	2.068
(CFO)	0.455	0.843	0.398	1.504
(D_SALE)	0.043	0.332	0.739	1.179
(DIV)	-0.081	-1.764	0.077	1.107
(LOSS)	0.420	2.210	0.028	1.499
(SRD)	-0.091	-1.170	0.241	1.126
(BR)	1.133	5.792	0.000	1.375
(IP)	-2.826	-3.403	0.000	1.363
(Q)	-0.034	-1.195	0.232	2.160
Constant	-1.148	-6.337	0.000	-
LR Test		114.952		
Prob.		(0.000)		
HL statistic		5.862		
Prob.		(0.662)		
Andrews Statistic		11.511		
Prob.		(0.319)		
McFadden R-SQ		0.266		

According to the continuation of the results of the first hypothesis test presented in Table 8, considering the low probability level (Prob.) of the Z statistic (0.000) of the acceptable error level, for the beta coefficient of 1 (independent variable), the test results show that the change in classification based on changes in unexpected core earnings (as an indicator of earnings change classification) has a positive and significant effect on the risk of stock price crash. The McFadden coefficient of determination also indicates that 26.6 percent of the changes in the risk of stock price crash are explained by the variables entered in the model. Of the control variables, the market-to-book ratio, the company's loss-making and the risk of bankruptcy have a positive effect on the risk of stock price crash, and the industry performance has a negative and significant effect.

Results of the second hypothesis test

The results of the second hypothesis test are as follows in Tables 8 and 9

Table 9. Model estimation results for the second hypothesis "Change of classification based on unexpected principal earning**"**

Variable name and symbol	Regression coefficient	Z statistic	Prob.	VIF statistic
(UE_CE)	0.479	3.617	0.000	1.501
SIZE	-0.553	-4.231	0.000	1.071
UE_CE* SIZE	-0.913	-3.005	0.001	2.004
(MB)	0.051	3.357	0.000	2.100
(CFO)	0.254	0.494	0.621	1.373
(D_SALE)	0.050	0.386	0.699	1.179
(DIV)	-0.080	-1.757	0.078	1.107
(LOSS)	0.375	2.390	0.011	1.534
(SRD)	-0.097	-1.240	0.214	1.132
(BR)	1.242	6.227	0.000	1.390
(IP)	-2.365	-2.770	0.005	1.437
(Q)	-0.048	-1.671	0.094	2.181
Constant	-0.921	-4.957	0.000	-
LR Test		133.274		
Prob.		(0.000)		
HL statistic		10.724		
Prob.		(0.217)		
Andrews Statistic		11.662		
Prob.		(0.308)		
McFadden R-SQ		0.276		

According to the results of the second hypothesis test presented in Table 9, considering the low probability level (Prob.) of the Z statistic (0.000) of the acceptable error level, for the beta coefficient of 3 (independent variable), the test results show that the size of the company and the change in classification based on unexpected main earning have a negative and significant effect on the risk of stock price crash. The McFadden determination coefficient also indicates that 27.6 percent of the changes in the risk of stock price crash are explained by the variables entered in the model. Of the control variables, the market-to-book ratio, the company's loss-making and the risk of bankruptcy have a positive effect on the risk of stock price crash, and the industry performance has a negative and significant effect.

Table 10. Model estimation results for the second hypothesis "Classification change based on unexpected changes in "core earnings

Variable name and symbol	Regression coefficient	Z statistic	Prob.	VIF statistic
(UE_DCE)	0.520	3.348	0.000	1.530
SIZE	-0.551	-4.231	0.000	1.061
UE_DCE* SIZE	-1.161	-2.727	0.006	1.989
(MB)	0.051	3.392	0.000	2.096
(CFO)	0.376	0.702	0.482	1.507
(D_SALE)	0.049	0.383	0.701	1.192
(DIV)	-0.080	-1.753	0.079	1.107
(LOSS)	0.366	2.361	0.013	1.510
(SRD)	-0.097	-1.237	0.216	1.130
(BR)	1.235	6.188	0.000	1.391
(IP)	-2.338	-2.772	0.005	1.399
(Q)	-0.049	-1.688	0.091	2.193
Constant	-0.942	-5.063	0.000	-
LR Test		134.066		
Prob.		(0.000)		
HL statistic		9.489		
Prob.		(0.211)		
Andrews Statistic		10.289		
Prob.		(0.301)		
McFadden R-SQ		0.277		

According to the continuation of the results of the second hypothesis test presented in Table 10, considering the low probability level (Prob.) of the Z statistic (0.000) of the acceptable error level, for the beta coefficient 3 (independent variable), the test results show that the size of the company and the change in classification based on unexpected changes in basic earnings have a negative and significant effect on the risk of stock price crash. The McFadden determination coefficient also indicates that 27.7 percent of the changes in the risk of stock price crash are explained by the variables entered in the model. Of the control variables, the market-to-book ratio, the company's loss-making and the risk of bankruptcy have a positive effect on the risk of stock price crash, and industry performance has a negative and significant effect.

Conclusions and Suggestions

Given that in the present study, the effect of earning classification change on the risk of stock price crash in Tehran Stock Exchange companies has been investigated. Therefore, the findings of the study show that earning classification change has a positive and significant effect on the risk of stock price crash, but company size has a negative and significant effect on the relationship between earning classification change and stock price crash risk. In general, the results of the hypotheses are consistent with the research of Giman et al. (2023) and the theoretical framework mentioned in the research of Andreou et al. (2023) and Kim et al. (2018). Regarding the analysis of the first hypothesis, it can be said that, given that "earning classification change" is a type of behavior of managers in relation to the creation of earnings management. Therefore, managers use this tool as a potential means to better portray the economic Profitability of a company. In general, earnings management leads to information asymmetry between company insiders and external stakeholders, so this leads to the risk of stock price crash. In other words, the use of earning reclassification by managers is actually a signal to the market that can lead to an information gap. In this regard, given that investors do not have the ability to understand the activities of earning management and recognize their efficiency or opportunism. Therefore, this creates negative fluctuations in the stock price. It should be noted that it is more difficult for stakeholders to recognize the change in earning classification when it is caused by opportunistic behaviors. Regarding the analysis of the second hypothesis, it can be said that in general, when the company is large, there are more opportunities for growth, because in these companies, more services are provided based on the company's resources. Often, in these companies, powerful managers are always used, considering their position in society. Accordingly, considering the legitimacy of large economic units in society (from the perspective of stakeholders), their managers try not to use opportunistic behaviors, such as changing earning classification, so this leads to a decrease in the risk of stock price crash. The following are the research suggestions: Managers should pay attention to improving the risk of stock price crash by not using earning classification as one of the indicators of earning management. Because this has a positive and significant effect on the risk of stock price crash. Given that company managers seek to gain the trust of stakeholders, it is recommended that they always seek not to use earning classification. Because this, considering its role in the risk of stock price crash, has become a negative sign in the market and indicates the unfavorable performance of the economic unit both in the financial and stock market areas of the company. Users of financial statements should always pay attention to variables such as company size when analyzing because their interests are related to these variables, which can have a strategic role in the field of choosing their investments. Capital market analysts are advised to pay attention to the negative relationship between company size and the relationship between earning reclassification and the risk of stock price crash. Because in general, not paying attention to market indicators can lead to increased information asymmetry and, as a result, a decrease in important market indicators. The Stock Exchange Organization is advised to seek to create information content during periods of risk of stock price crash and, in the event of failure to disclose an acceptable level of information (in relation to prominent market indicators), to use legal tools to force companies to do so.

References

Abernathy, J.L., Beyer, B., Rapley, E.T., (2014). Earnings management constraints and classification shifting. J. Bus. Finance Account. 41 (5–6), 600–626. [Google Scholar] [Publisher] https://doi.org/10.1111/jbfa.12076

Adut, D., Cready, W.H., Lopez, T. J., (2003). Restructuring charges and CEO cash compensation: A reexamination. Account. Rev. 78 (1), 169–192. [Google Scholar] [Publisher] https://doi.org/10.2308/accr.2003.78.1.169

Akhgar, M. O; Karami, A. (2014). Firm Characteristics and Financial Reporting Quality of Quoted Listed Companies in Tehran Stock Exchange. Journal of Iranian Accounting Review, 1(4), 1-22. [In Persian] [Google Scholar] [Publisher]

Al Mamun, M.D., Balachandran, B., Duong, H.N., Gul, F.A., (2021). Are corporate general counsels in top management effective monitors? Evidence from stock price crash risk. Europ. Account. Rev. 30 (2), 405–437. [Google Scholar] [Publisher] https://doi.org/10.1080/09638180.2020.1763819

Amihud, Y. (2002). Illiquidity and stock returns: cross-section and time-series effects. Journal of Financial Markets, 5(1), 31-56. [Google Scholar] [Publisher] https://doi.org/10.1016/S1386-4181(01)00024-6

Andreou, P. C; Lambertides, N; Magidou, M. (2023). Stock Price Crash Risk: A Critique of the Agency Theory Viewpoint. SSRN Electronic Journal. [Google Scholar] [Publisher] https://doi.org/10.2139/ssrn.3774424

Andreou, P.C., Antoniou, C., Horton, J., Louca, C., (2016). Corporate governance and firmspecific stock price crashes. Europ. Financ. Manag. 22 (5), 916–956. [Google Scholar] [Publisher] https://doi.org/10.1111/eufm.12084

Ashraf, N.D., and Shen, Y. 2019. Economic policy uncertainty and banks' loan pricing, Journal of Financial Stability, 44:100695. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfs.2019.100695

Baber, W.R., Kang, S.H., Kumar, K.R., (1998). Accounting earnings and executive compensation: The role of earnings persistence. J. Account. Econ. 25 (2), 169–193. [Google Scholar] [Publisher] https://doi.org/10.1016/S0165-4101(98)00021-4

Badertscher, B. A. (2011). Overvaluation and the Choice of Alternative Earnings Management Mechanisms. Accounting Review, 86(5), 1491-1518. [Google Scholar] [Publisher] https://doi.org/10.2308/accr-10092

Benmelech, E., Kandel, E., Veronesi, P., (2010). Stock-based compensation and CEO (dis)incentives. Q. J. Econ. 125 (4), 1769–1820. [Google Scholar] [Publisher] https://doi.org/10.1162/qjec.2010.125.4.1769

Bleck, A., Liu, X., (2007). Market transparency and the accounting regime. J. Account. Res. 45 (2), 229–256. [Google Scholar] [Publisher] https://doi.org/10.1111/j.1475-679X.2007.00231.x

Bloom, N., Draca, M, and Van Reenen, J. (2016). Trade induced technical change: The impact of Chinese imports on innovation, diffusion, and productivity. Review of Economic Studies 83(1), 87-117. [Google Scholar] [Publisher] https://doi.org/10.1093/restud/rdv039

Bradshaw, M.T., Sloan, R.G., (2002). GAAP versus the street: An empirical assessment of two alternative definitions of earnings. J. Account. Res. 40 (1), 41–66. [Google Scholar] [Publisher] https://doi.org/10.1111/1475-679X.00038

Callen, J.L., Fang, X., (2015). Short interest and stock price crash risk. J. Bank. Financ. 60, 181–194. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jbankfin.2015.08.009

Callen, J.L., Khan, M., Lu, H. (2013). Accounting quality, stock price delay, and future stock returns. Contemporary Accounting Research, 30(1), 269-295. [Google Scholar] [Publisher] https://doi.org/10.1111/j.1911-3846.2011.01154.x

Cao, H., Coval, D., Hirshleifer, D., (2002). Sidelined investors, trading-generated news, and security returns. Rev. Financ. Stud. 15 (2), 615–648. [Google Scholar] [Publisher] https://doi.org/10.1093/rfs/15.2.615

Chen, J., Hong, H., Stein, J.C., (2001). Forecasting crashes, trading volume, past returns, and conditional skewness in stock prices. J. Financ. Econ. 61 (3), 345–381. [Google Scholar] [Publisher] https://doi.org/10.1016/S0304-405X(01)00066-6

Chiang, T.C., Nelling, E., Tan, L. (2008). The speed of adjustment to information: Evidence from the Chinese stock market. International Review of Economics & Finance, 17(2), 216-229. [Google Scholar] [Publisher] https://doi.org/10.1016/j.iref.2007.06.004

Cohen, L.J., Cornett, M.M., Marcus, A.J., Tehranian, H., (2014). Bank earnings management and tail risk during the financial crisis. J. Money, Credit Bank. 46 (1), 171–197. [Google Scholar] [Publisher] https://doi.org/10.1111/jmcb.12101

Dixit, A.K., and Pindyck, S.R. 1994, Investment under uncertainty, Princeton University Press: Princeton, NJ. [Google Scholar] [Publisher]

Ewert, R. and A. Wagenhofer (2005), 'Economic Effects of Tightening Accounting Standards to Restrict Earnings Management', The Accounting Review, Vol. 80, pp. 1,101–24. [Google Scholar] [Publisher] https://doi.org/10.2308/accr.2005.80.4.1101

Fallah, Farzaneh (2021). "Investigating the Effect of Financial Statement Comparability on the Relationship between Earnings Announcement and Lagged Stock Price Reaction". Master's Thesis, Islamic Azad University, Central Tehran Branch. [Publisher]

Francis, B., Hasan, I., Li, L., (2016). Abnormal real operations, real earnings management, and subsequent crashes in stock prices. Rev. Quant. Financ. Account. 46 (2), 217–260. [Google Scholar] [Publisher] https://doi.org/10.1007/s11156-014-0468-y

Fun, Y, A, Barua,W. S, Cready, W. B, Thomas. (2010). Managing Earnings Using Classification Shifting: Evidence from Quarterly Special Items, The Accounting Review, Vol. 5, No. 4, PP. 1303–1323. [Google Scholar] [Publisher] https://doi.org/10.2308/accr.2010.85.4.1303

Giman, Nam. Juhee Hwang. Cheol Lee. (2023). Classification Shifting and Future Stock Price Crash Risk. This preprint research paper has not been peer reviewed. Electronic copy available at: https://ssrn.com/abstract=4410747 [Google Scholar] [Publisher] https://dx.doi.org/10.2139/ssrn.4410747

Gu, Z., Chen, T., (2004). Analysts' treatment of nonrecurring items in street earnings. J. Account. Econ. 38, 129–170. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jacceco.2004.09.002

Hong, H., Stein, J., (2003). Differences of opinion, short-sales constraints, and market crashes. Rev. Financ. Stud. 16 (2), 487–525. [Google Scholar] [Publisher] https://doi.org/10.1093/rfs/hhg006

Hua, Debao. Jingming Lub. Sibo Zhaoc. (2023). Does Trade Policy Uncertainty Increase Commercial Banks' Risk-Taking? Evidence from China. Humanities and Social Science Research. [Google Scholar] [Publisher] https://doi.org/10.1016/j.iref.2023.10.044

Hutton, A. P., Marcus, A. J., & Tehranian, H. (2019). Opaque financial reports and crash risk. Journal of Financial Economics. (1) 49, pp. 67-86. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfineco.2008.10.003

Hutton, A.P., Marcus, A.J., Tehranian, H., (2009). Opaque financial reports, R2, and crash risk. J. Financ. Econ. 94 (1), 67–86. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfineco.2008.10.003

Jelinek, Kate. (2007). The Effect of Leverage Increase on Earning Management. Journal of Business and Economic Studies, Vol. 13, No. 2, PP. 2. [Google Scholar] [Publisher]

Jin, L., Myers, S.C., (2006). R2 around the world: New theory and new tests. J. Financ. Econ. 79 (2), 257–292. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfineco.2004.11.003

Kahle, M.K., and Stulz, R.M. (2013). Access to capital, investment, and the financial crisis Journal of Financial Economics, 110 (2), 280-299. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfineco.2013.02.014

Kim, J.-B., Li, Y., Zhang, L., (2011). CFOs versus CEOs: Equity incentives and crashes. J. Financ. Econ. 101 (3), 713–730. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfineco.2011.03.013

Kim, J.B., Li, Y., Zhang, L., (2018). Corporate tax avoidance and stock price crash risk: firm-level analysis. [Google Scholar] [Publisher] https://doi.org/10.1016/j.jfineco.2010.07.007

Kim, J.-B., Zhang, L., (2014). Financial reporting opacity and expected crash risk: Evidence from implied volatility smirks. Contemp. Account. Res. 31 (3), 851–875. [Google Scholar] [Publisher] https://doi.org/10.1111/1911-3846.12048

Kim. J.B., Zhang, L. (2016). CEO overconfidence and stock price crash risk.Contemporary Accounting Research. Vol. 33 (1), PP. 78-114. [Google Scholar] [Publisher] https://doi.org/10.1111/1911-3846.12217

Kinney, M., Trezevant, R., (1997). The use of special items to manage earnings and perceptions. J. Financ. Stat. Anal. 3, 45–54. [Google Scholar] [Publisher]

Lieh-Ming Luo, Hui-Tzu Lee, Chia-Chou Chiu, Chih-Wei Lee. (2022). The relations of corporate risk, operating efficiency, and firm size to managerial compensation: Evidence from Taiwan stock market-listed companies. Asia Pacific Management Review. [Google Scholar] [Publisher] https://doi.org/10.1016/j.apmrv.2022.09.001

Lipe, R.C. (1986). The information contained in the components of earnings. J. Account. Res. 24 (Supplement), 37–64. [Google Scholar] [Publisher] https://doi.org/10.2307/2490728

McVay, S. (2006). Earnings management using classification shifting: An examination of core earnings and special items. The Accounting Review 81 _May_: 501–531. [Google Scholar] [Publisher] https://doi.org/10.2308/accr.2006.81.3.501

Merkley, K., Michaely, R., Pacelli, J. (2017). Does the scope of the sell-side analyst industry matter? An examination of bias, accuracy, and information content of analyst reports. The Journal of Finance, 72(3), 1285-1334. [Google Scholar] [Publisher] https://doi.org/10.1111/jofi.12485

Morck, R., Yeung, B., Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements? Journal of Financial Economics, 58(1-2), 215-260. [Google Scholar] [Publisher] https://doi.org/10.1016/S0304-405X(00)00071-4

Pástor, L., and Veronesi, P. 2012.Uncertainty about government policy and stock prices. The Journal of Finance, 67 (4), 1219-1264. [Google Scholar] [Publisher] https://doi.org/10.1111/j.1540-6261.2012.01746.x

Pyrgiotakis, Emmanouil G. Thanos Verousis. Mengyu Zhang. (2024). High-frequency trading and stock price crash risk. 55 Pages Posted: 27 Jan 2024. [Google Scholar] [Publisher] https://doi.org/10.2139/ssrn.4705469

Qian, M., Sun, P.W., Yu, B. (2017). High turnover with high price delay? Dissecting the puzzling phenomenon for China's a-shares. Finance Research Letters, 22, 105-113. [Google Scholar] [Publisher] https://doi.org/10.1016/j.frl.2017.06.004

Ryu, D., Park, S.G., Yang, H. (2017). Noise Traders, mispricing, and price adjustments in derivatives markets. Available at SSRN: https://ssrn.com/ abstract=3320266. [Google Scholar] [Publisher] https://doi.org/10.1080/1351847X.2019.1692887

Sadok El Ghoul, Omrane Guedhami, Yongtae Kim. (2021). “Policy Uncertainty and Accounting Quality”. Santa Clara University and Korea Advanced Institute of Science and Technology (KAIST). [Google Scholar] [Publisher] https://doi.org/10.2308/TAR-2018-0057

Saghafi, Ali. Jamalianpour, Mozaffar. (2018). "The Place of the Classification Change Phenomenon in Earnings Management". Quarterly Scientific Research Journal of Experimental Studies in Financial Accounting. Year 14. Issue 57. pp. 1-23. [Google Scholar] [Publisher] https://doi.org/10.22054/qjma.2018.8911

Sen, S., Singh, B., Mazumder, S. (2017). Efficient market hypothesis: A study on Indian Capital Market. Research Bulletin, 42(4), 69-79. [Publisher] https://doi.org/10.33516/rb.v42i4.69-79p

Shahini, M. (2013). Stock markets crash. Master thesis. Kharazmi University, Iran, (In Persian). [Publisher]

Wang Fengrong, Mbanyele William, Muchenje Linda. (2022). “Economic policy uncertainty and stock liquidity: The mitigating effect of information disclosure”. Research in International Business and Finance 59 (2022) 101553. [Google Scholar] [Publisher] https://doi.org/10.1016/j.ribaf.2021.101553

Zang, A. Y. (2012). Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management. Accounting Review, 87(2), 675-703. [Google Scholar] [Publisher] https://doi.org/10.2308/accr-10196