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An Investigation of the Effect of Disclosure Quality on Future Stock Price Crash Risk with Moderating Effect of Auditing Firm's Industry Specialization: Evidence from Tehran Stock Exchange

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Abstract

The present study aimed at investigating the effect of auditing firm's industry specialization on the relationship between disclosure quality and future stock price crash risk of the firms accepted in Tehran Stock Exchange. With respect to the objective, methodology, and results, the present study was of analytical, quantitative and ex-post facto, and applied nature, respectively. Accordingly, 'Market Share Approach' was employed in order to measure the level of 'Auditing Firm's Industry Specialization,' on the one hand, and the criterion of 'Negative Skewness of Stock Return' was utilized so as to measures the 'Stock Price Crash Risk,' on the other. Sample population of the study included 58 firms accepted in Tehran Stock Exchange whose data were investigated over years 2006 to 2015. In order to test the hypotheses of the study, statistical measure of Multivariate Linear Regression Analysis was employed under OLS and GLS methods. The findings aggregated from analyzing the hypotheses of the study indicated that an increase in the disclosure quality can significantly result in a decrease in the future stock price crash risk, whereas an increase in the auditing firm's industry specialization can significantly result in an increase in the disclosure quality.

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Generally, the findings revealed that the auditing firm's industry specialization (as a moderating variable) can significantly result in amplification of the negative relationship between disclosure quality and future stock price crash risk.

Keywords: Auditing firm's industry specialization; agency theory; signaling theory; future stock price crash risk.

1. Introduction

The phenomenon of Stock Price Crash is one of the factors resulting in investors' lack of trust and pessimism with respect to capital market. In this regard, stock price crash risk in market is one of the major concerns of investors [1], which may finally lead to discharge of financial resources from capital market. On the other hand, one of the reasons behind occurrence of stock price crash is stockpile of unrevealed bad news. More specifically, in case firm's managers conceal bad news over a certain period, firm's stock becomes overpriced compared to its main price. When the mentioned stockpile of bad news exceeds a definite point, the managers cannot conceal them any longer and the respective disclosure accelerates a stock price crash.

Signaling Theory, as one of the theories supporting unregulated markets, emphasizes that firms are motivated to disclose voluntarily due to existence of the competitive factor in capital market as well as access to scarce capital resources. Firms having bad news shall inevitably disclose their results to keep their credibility in capital market. Furthermore, Signaling Theory is of the opinion that fair and intact reporting results in a decrease in the firm's capital expense, and this is due to the fact that lack of trust is seen less concerning those firms providing a reliable and comprehensive reporting which in turn leads to a decrease in investment risk [2]. According to Signaling Theory, auditors can also decrease stock price crash risk through their informational role by reducing agency costs, decreasing malfeasance by managers, improving operating decisions, and decreasing expropriation [3].

Moreover, another factor being expected to affect stock price crash risk is auditor's industry specialization. More specifically, high-quality auditors are more likely to uncover bad news and improve the quality of financial statements because of their greater capability (e.g., personnel, training, experience). In addition, high-quality auditors, for reasons such as preserving their reputation and lowering their liability, have stronger incentives to ensure timely disclosure of bad news and suppress managers' bad news hoarding activities [4,5]. With reference to the abovementioned issues, the present study aims at finding an appropriate answer to the following questions:

Does auditing firm's industry specialization result in improvement of firm's disclosure quality? And does disclosure quality obtained from increase in auditing firm's industry specialization decrease future stock price crash risk of firms accepted in Tehran Stock Exchange?

Albeit a review on literature shows that there are a great deal of experimental studies in the realm of factors effective on the stock price crash risk, to the researcher's best of knowledge, no study has been ever conducted in Iran with respect to the effect of auditing firm's industry specialization on the relationship between disclosure

quality and future stock price crash risk. Finding reasons behind occurrence of stock price crash, providing models to predict this phenomenon, and proposing strategies to avoid occurrence of this phenomenon in capital markets are very significant to managers of the capital markets who have always been trying to boom markets by attracting stagnant capitals. Generally, the present study was aimed at analyzing the effect of auditing firm's industry specialization on the relationship between disclosure quality and future stock price crash risk of firms accepted in Tehran Stock Exchange.

2. Theoretical Bases & Literature Review

2.1 Theoretical Bases

Auditing firm's industry specialization is one of the main aspects of auditing quality [6]. Previous studies are indicative of the fact that a specialized auditor can provide a more effective and precise auditing. For instance, the researchers in [7] proved that auditors with industry-specific knowledge differentiate themselves from competitors and have competitive advantages in terms of costs and services.

The researcher in [8] defines auditing firm's industry specialization as follows:

"Industry specialization involves developing constructive ideas to assist ("add value to") clients, as well as providing new insights or solutions to some of the issues clients face in their respective industries".

Due to the fact that different aspects of auditing firm's industry specialization cannot be directly observed, previous studies have applied different indexes to measure this phenomenon. For instance, Market Share Approach and Portfolio Share Approach are frequently employed to measure auditing firm's industry specialization. The present study has employed Market Share Approach to measure auditing firm's industry specialization because of the fact that this approach shows priority of industry-specialized auditors to other auditors. Accordingly, the more auditors' market share, the more auditor's industry specialization and experience, compared to other auditors', would be. Furthermore, having a high market share is indicative of the fact that "the auditor successfully differentiates himself from other competitors with respect to auditing quality" [9].

Market Share Approach defines an industry-specialized auditing firm as the one which differentiates itself from other competitors with respect to market share in a specific industry. This approach assumed that the level of auditing firm's industry specialization can be measured by observing the relative share of auditing firms' market providing service to a specific industry. A firm having a higher market share shall have a higher specialization concerning the respective industry. Furthermore, considerable market share in a certain industry is indicative of the noticeable investment made in auditing firms to develop industry-specific auditing technologies in such a way that the privileges resulted from auditing quality and economic efficiency (savings resulted from mass production scale) are expected to be increased [10].

During recent years and especially after financial crisis in 2008, the subject of sudden change in stock price has attracted the attention of most academics and professionals. Such changes generally occur in two ways including

'stock price crash' and 'stock price jump.' Due to the fact that stock returns are very important for investors, the phenomenon of stock price crash resulting in a considerable decrease has attracted the researchers' attention more than the phenomenon of stock price jump. Definition of stock price crash includes three specific features [11]:

A) "Stock price crash is a significant and unusual change in stock price which occurs without occurrence of a significant economic incident.

B) These significant changes are negative.

C) Stock price crash is a contagious phenomenon in market. More specifically, stock price decrease is not merely exclusive to a specific share, rather, it includes all types of shares in the market."

Approximately, in all of the previously conducted studies, the phenomenon of stock price crash has been defined as a phenomenon synonymous with the negative skewness of stock return.

In the present study, the criterion of 'Negative Skewness of Stock Return' has been employed in order to measure future stock price crash risk. Those firms that utilize specialist auditors enjoy a lower voluntary accruals. In other words, specialist auditors avoid from earnings management which in turn will lead to an increase in transparency of financial statements [12]. Furthermore, non-transparency of financial statements and concealing firm's losses by the managers (through earnings management) results in stock price crash as well as sudden disclosure of firm's losses in long-term [13]. On the other hand, literature review [14] concerning the present study indicates that an auditor with a high-quality auditing can reduce stock price crash risk significantly as does an industry specialist auditor. For several reasons, the present study considers specialist auditors as informational mediators (between informed managers and uninformed users) who can decrease accumulation of bad news.

First, due to their high talents, high-quality auditors can be the most appropriate experts to uncover bad news and improve the quality of financial statements because of their greater capability (e.g., personnel, training, experience). Second, industry-specialized auditors, for reasons such as preserving their reputation and lowering their liability, have stronger incentives to ensure timely disclosure of bad news and suppress managers' bad news hoarding activities [15,16]. Considering these arguments, it is reasonable to posit that the higher the quality of auditors, the greater the prompt disclosure of bad news, and, therefore, the lower the level of stock price crash risk.

2.2 Literature Review

2.2.1 Studies Conducted in Iran

In their study, the researchers in [17] investigated the relationship between auditing quality and earning management among 61 firms accepted in Tehran Stock Exchange over years 2001 to 2007. In order to measure auditing quality, they employed two measures of auditing firm's size and auditor's tenure period. Findings of

their study indicated that there was a positive relationship between earning management and auditing firm's size which was statistically insignificant. Furthermore, the results showed that there was a positive and statistically significant relationship between earning management and auditor's tenure period.

In another study, the researchers in [18] carried out a study on the analysis of non-transparency of financial information on future stock price crash risk among 90 firms accepted in Tehran Stock Exchange over years 2001 to 2009. In order to measure future stock price crash risk, they utilized the criterion of stock price crash period according to the study conducted by the researchers in [19]. The results of their study were indicative of the fact that there is a direct relationship between non-transparency of financial information and future stock price crash risk. More specifically, the more non-transparency of financial reporting, the more future stock price crash risk. Furthermore, the findings of their study revealed whenever there is an informational asymmetry between managers and investors, the effect of non-transparency of financial information on increase of future stock price crash risk is more.

The researchers in [20] conducted a study under the title of 'auditing firm's industry specialization and management of voluntary accruals' and investigated the effect of auditing quality on earning management among 117 firms accepted in Tehran Stock Exchange over years 2005 to 2009. The findings of their study indicated that those companies whose auditors have industry specialization enjoy a lower voluntary accruals management level; rather, they include a higher disclosure quality level.

In their study, the researchers in [21] investigated the effect of firm's features on stock price crash risk of firms accepted in Tehran Stock Exchange. Their sample population included a number of 87 firms over years 2007 to 2013. The results of their study revealed that the variables of return of assets, size of firm, market to book value ratio, and Tobins-Q ratio had a statistically significant effect on stock price crash risk. However, return on equities and leverage ratio have no statistically significant effect on stock price crash risk.

The researchers in [22] investigated the effect of type of institutional ownership on future stock price crash risk in firms accepted in Tehran Stock Exchange. Their sample population included a number of 80 firms over years 2004 to 2012. The findings of their study were indicative of the fact that, generally, institutional ownership has a positive and statistically significant effect on stock price crash risk. However, by grouping institutional ownership in active and inactive groups, the results of their study indicated that the positive effect of institutional ownership on future stock price crash risk is resulted from existence of inactive institutional owners, and the supervising effect of active institutional owners results in a decrease of future stock price crash risk.

In their study, the researchers in [23] investigated the relationship between auditing quality and restatement resulted from earning management and cash management among 164 firms accepted in Tehran Stock Exchange over years 2006 to 2014. The results of their study indicated that there is a statistically significant relationship between auditing quality and restatement. In other words, the more auditing quality, the less the probability of restatement resulted from earning management and cash management. Furthermore, the results of their study indicated that there is a negative and statistically significant relationship between auditing firm's size and

auditor's specialization, on the one hand, and all of the three criteria of restatement. Furthermore, they founded that there is a positive and statistically significant relationship between tenure period and restatement in general, on the one hand, and restatement resulted from earning management, on the other.

2.2.2 Studies Conducted in Abroad

In their study, the researchers in [24] investigated the auditor's tenure period and earning quality. The findings of their study indicated that long auditor's tenure period can result in the auditor's understanding and specialization in the respective industry, and the longer the auditor's tenure period, the more the earning's quality and stability.

The researchers in [25] investigated the relationship between stockpile of unrevealed bad news and stock price crash risk. They claimed that mangers control revealing firm's information to the public, and that there is a threshold level at which bad news are not forbidden to be revealed anymore. They further founded out that lack of adequate transparency with respect to investment, managers' executive decisions, and firm's performance can let managers keep some part of the cash flows (which the external investors are not able to detect) with themselves. According to the findings of their study, managers are willing to control the limited descending motion and the loss related to temporary bad performance by concealing bad news about their firm. However, in case long-term bad news reach a critical threshold, managers will have to surrender to concealing the respective bad news. In such case, the entire negative shocks of the firm will be abruptly revealed which in turn will lead to the firm's stock price crash.

In their study, the researchers in [26] investigated the relationship between auditing quality and stock liquidity. In order to measure the auditing quality, they utilized two criteria of industry specialization and auditing firm's tenure period. The findings of their study revealed that there is a direct relationship between stock liquidity and utilization of industry-specialized auditor, and that there is a negative and statistically significant relationship between auditing firm's tenure period and stock liquidity.

The researcher in [27] carried out a study on the relationship between auditor's industry specialization and increase of auditing remuneration in New Zealand. The results of the study indicated that auditor's industry specialization has no effect on auditing remuneration. In other words, in New Zealand, there is no relationship between auditor's specialization in a specific industry and increase of auditing remuneration.

The researchers in [28] conducted a study on the relationship between stock price crash risk and short-term interest. The findings of their study confirmed the fact that there is a positive and statistically significant relationship between these two variables. Furthermore, the mentioned finding can be seen more in firms with poor mechanism and high risk as well as those firms with lack of information symmetry.

In another study, the researchers in [29] investigated the effect of auditor's industry specialization on stock price crash risk. In order to measure the auditing quality, they utilized criterion of auditor's industry specialization. Their sample population included 58365 observations over years 1990 to 2009 concerning the United States' securities. The findings of their study indicated that there is a negative and statistically significant relationship

between auditor's industry specialization on stock price crash risk. This relationship is indicative of the fact that high-quality auditors can be directly beneficial for the investors by decreasing the probable risk. Furthermore, they provided some evidences concerning the fact that auditor's industry specialization can decrease the effect of accounting conservatism and tax avoidance on stock price crash risk.

3. Hypotheses of the Study

1. Disclosure quality has a statistically significant effect on future stock price crash risk of the firms accepted in Tehran Stock Exchange.

2. Auditing firm's industry specialization has a statistically significant effect on disclosure quality of the firms accepted in Tehran Stock Exchange.

3. Auditing firm's industry specialization has a statistically significant effect on the relationship between disclosure quality and future stock price crash risk.

4. Methodology

With respect to the objective, methodology, and results, the present study was of analytical, quantitative and ex-post facto, and applied nature, respectively. In order to collect the respective data required for theoretical bases and literature review concerning the subject of the present study, library method was used. Moreover, in order to collect data required for executing the respective statistical tests, the financial statements of the firms accepted in Tehran Stock Exchange as well as two data bases named Tadbir Pardaz and Rahavard Novin were utilized in the study. In this study, in order to measure variables of the study, the respective raw data were processed in Excel Software. Then, in order to test the respective hypotheses, Eviews Software (Version 7) was employed. In order to test the hypotheses of the study, multivariate linear regression was utilized.

4.1 Sample Population

The sample population of the present study has been adopted from the financial information of 58 firms accepted in Tehran Stock Exchange whose data were investigated over years 2006 to 2015.

4.2 Variables of the Study

4.2.1 Independent Variable

The independent variable of the present study is disclosure quality. In order to measure disclosure quality, the yearly disclosure quality point provided by Tehran Stock Exchange Organization (which is announced by the notice of firms' ranking in terms of disclosure quality and appropriate notification) has been utilized in the study. The mentioned point is estimated on the basis of the time of presentation of information related to income prediction of each share, non-audited 3-, 6-, and 9-month midterm financial statements, auditor's opinion with respect to income prediction of each primary and 6-month share, auditor's opinion with respect to the 6-month

midterm financial statements, non-audited financial statements at the end of the year as well as the differences among predictions and real audited performance. Furthermore, in case of non-presentation of the audited end-of-year financial statements as well as the time schedule for paying dividends in due time, a negative point shall be considered for each delayed day.

4.2.2 Moderating Variable

In this study, auditing firm's industry specialization has been measured by 'Market Share Approach.' This is because of the fact that the mentioned approach shows the priority of the industry-specialized auditor over the other auditors. The more the auditor's market share, the more the auditor's industry-specialization and experience would be compared to other competitors. Having a dominant market share indicates the fact that the auditor has successfully differentiated himself from other competitors in terms of auditing quality. Auditors' market share is calculated by the following equation:

$$\frac{\text{Total Operational Incomes of Firms Audited by an Auditing Firm Specialized in an Industry}}{\text{Total Operational Incomes of all Firms existing in the same Industry}}$$

In the present study, those firms whose market share in a specific industry (according to the abovementioned equation) is above 20 percent [30,31,32] are regarded as industry-specialized firms. If the auditing firm is specialized in industry, figure 1 is attributed to it; otherwise, figure 0 is attributed. It is noteworthy that in the research studies carried out with respect to the abovementioned equation, instead of operational income the factor of sales has been used. However, due to the fact that there may be service providing companies in the sample population of the study, the phrase 'operational income' has been used instead of 'sales' in the mentioned equation in order for a better understanding.

4.2.3 Dependent Variable

In the present study, in order to measure future stock price crash risk, the criterion of negative skewness of stock return has been used. In order to measure future stock price crash risk, first, specific monthly return of the respective firm is calculated through equation (1) [33,34,35,36,37,38].

$$r_{i,t} = \alpha_j + \beta_{1,i}\, r_{m,t-2} + \beta_{2,i}\, r_{m,t-1} + \beta_{3,j}\, r_{m,t} + \beta_{4,j}\, r_{m,t+1} + \beta_{5,j}\, r_{m,t+2} + \varepsilon_{j,t} \qquad (1)$$

In this equation:

ri,t: refers to the monthly stock return of firm i in month t over the fiscal year.

rm,t: refers to the market's monthly return in month t. It is noteworthy that the index of the beginning of the month minus the index of the end of the month divided by the index of the beginning of the month shows the market's monthly return.

εi,t: refers to the residual of the regression model in equation (1) which is the monthly specific return of firm i in month t.

Then, in order to scale the respective data, the firm's monthly specific return is calculated according to equation (2):

$$W_{i,t} = Ln\ (1 + \varepsilon_{i,t}) \quad (2)$$

In equation (2):

$W_{i,t}$: refers to the standardized monthly specific return of firm i in month t over the respective fiscal year.

$\varepsilon_{i,t}$: refers to the monthly specific return of firm i in month t.

By using monthly specific return of firm (w), negative skewness of stock return is calculated through equation (3):

$$NCSKEW_{i,t} = -\left(n\,(n-1)^{\frac{3}{2}} \sum w_{i,t}^{3} \Big/ (n-1)(n-2)\left(\sum W_{i,t}^{2}\right)^{\frac{3}{2}} \right) \quad (3)$$

In equation (3):

$NCSKEW_{i,t}$: refers to the negative skewness of monthly stock return of firm i over fiscal year t.

$W_{i,t}$: refers to monthly specific return of firm i in month t.

N: refers to the number of months whose return have not been calculated.

4.2.4 Controlling Variables

Controlling variables required for providing a precise explanation for the dependent variables are considered by independent variables according to what follows [39]. Ratio of market value of equity to book value of equity: refers to market value of total firm stock divided by book value of firm equity. Return on Assets: refers to earnings before interest and tax (that is, net operational earning) to the average of firm's total assets. Due to the fact that interest and tax are determined through factors other than effective application of resources, net operational earning is utilized to calculate this ratio. Financial Leverage: refers to the ratio of book value of long-term debts to book value of total assets. Firm Size: in order to calculate the variable of firm size, such criteria as logarithm of total assets are used. In the present study, natural logarithm of firm's assets has been considered as a criterion of firm size.

Therefore, in order to provide a precise explanation for dependent variable by independent variable, and to control it in the present study, the criterion of accounting conservatism has been utilized. Index of conservatism is calculated through equation (4) [40].

$$CI_{it} = \frac{OI_{it} + D_{it} - OP_{it}}{A_{it-1}} * (-1) \quad (4)$$

In equation (4):

$CI_{i,t}$: refers to the index of conservatism of firm i in year t.

$OI_{i,t}$: refers to the operational earning of firm i in year t.

$D_{i,t}$: refers to the depreciation of firm i in year t.

$CFO_{i,t}$: refers to the cash flows resulted from the operational activities of firm i in year t.

$A_{i,t-1}$: refers to the total assets of firm i at the end of the previous period t-1.

Auditing Firm Size: In order to measure auditing firm size, dummy (binary) variable have been used in the present study. More specifically, if a firm has been audited by the Auditing Organization, figure 1 is attributed to it; otherwise, figure 0 is attributed. The previous study shows that the auditing firm size has a statistically significant effect on disclosure quality [41].

Firm Records: Firm records is referred to as the number of years passed from the time of acceptance of the firm in Tehran Stock Exchange Organization. Furthermore, the previous studies are indicative of the fact that firm records have a statistically significant effect on firms' disclosure quality [42].

5. Findings of the Study

5.1 Descriptive Statistics

In order to provide a primary description for the respective data, such indexes as mean, standard deviation, and minimum and maximum of data were utilized in the present study, and Jarque-Bera statistical measure was employed to determine normal distribution of the data and the respective results are presented in Table (1).

According to Table (1), mean of firm size indicates that mean of logarithm of total assets of the firms under study is 5.98. Furthermore, mean of return on assets shows that return on assets of the firms under study includes a positive average of 13.44 percent. Mean of financial leverage (which is the ratio of book value of long-term debts to book value of total assets) is indicative of the fact that, on the average, the firms under investigation of the present study have supplied merely 7.4 percent of their assets through long-term debts. Mean value of the ratio of market value to book value of equity indicates that, on the average, market value of equity of the firms under investigation of the present study is about 2.4 more than the book value of equity of that firms. Mean value of the variable of conservatism is -0.07. The more negative the value of the mentioned variable, the more conservative the firm would be. With reference to the mentioned relation it can be concluded that, on the average, the firms under investigation of the present study include a low level of conservatism.

Table 1: Descriptive statistical measures of the study

Title of Variables	Symbol	Max.	Min.	Standard Deviation	Mean
Dependent Variable:					
Negative Skewness of Stock Return	NCSKEW	3.5185	-3.6406	1.4340	0.1118
Independent Variable:					
Disclosure Quality	DISQ	2.0000	0.6021	0.2351	1.7153
Moderating Variable:		2.9725	0.6921	0.3830	1.5693
Auditing Firm's Industry Specialization	SPECIALIST	1.0000	0.0000	0.4951	0.4276
Controlling Variables:					
Firm Size	SIZE	7.8675	4.7943	0.5883	5.9817
Return on Assets	ROA	0.4291	-0.1234	0.1085	0.1344
Financial Leverage	LEV	0.4833	0.0004	0.0682	0.0736
Market Value to Book Value of Equity	MTB	5.8777	0.1773	1.3900	2.4234
Conservatism	CONSERV	0.2645	-0.3866	0.1194	-0.0723
Auditing Firm Size	BIG	1.0000	0.0000	0.4805	0.3603
Firm's Records of Acceptance in Stock Exchange	REC	1.6721	0.3010	0.2061	1.1655

Moreover, reliability of independent, dependent and controlling variables of the present study was measured. The respective results showed that the significance level of unit root test of Levin, Lin and Chow is less than 5% which in turn is indicative of the fact that the whole variables of the study are reliable. This means that mean, variance and covariance of the respective variable during different years are fixed. Therefore, firms under investigation of the present study have not had any structural changes, and using such variables in the regression model does not result in creation of a pseudo regression.

5.2 Inferential Statistics

In order to ensure hypothesis testing of each regression model of the present study, the respective required tests were executed for each hypothesis. The results of hypothesis testing are presented in Table (2). Results of Multicollinearity Test with respect to the models of the present study (as presented in Table 2 above) are indicative of the fact that the value of VIF Statistic for all of the three models is less than 5, which shows that there is not a full multicollinearity between independent variables in all of the three models of the study. Significance level of F Statistic resulted from Heteroscedasticity Test (which has been conducted by Breusch-

Pagan-Godfrey method and presented in Table 2) is more than 5 percent for the models 1 and 3 of the present study. Therefore, there is a homoscedasticity among residuals in models 1 and 3, and this hypothesis is the case with models 1 and 3. However, Significance level of F Statistic for model 2 is less than 5 percent (0.0156) which shows that there is no homoscedasticity among residuals in model 2. In order to eliminate the problems related to heteroscedasticity among residuals, and to avoid from a pseudo regression model, the second hypothesis of the study was tested by Generalized Least Squares (GLS) method.

Table 2: Summary of results of hypothesis testing of regression model

Models	Autocorrelation Test	Residuals Normality Test		Heteroscedasticity Test		Multicollinearity Test
	D.W Statistic	J.B Sig.	J.B Statistic	F Sig.	F Statistic	VIF Statistic
Model 1	1.7645	0.0001	17.6647	0.0714	1.9468	1.01-1.21
Model 2	1.7562	0.0000	420.4161	0.0156	2.8283	1.03-1.70
Model 3	1.8505	0.0003	15.9540	0.1122	1.6338	1.02-3.45

Results of Residuals Normality Test are presented in Table 2. Value of Jarque-Bera statistic resulted from Residuals Normality Test is less than 5 percent for all of the three models of the present study, and thus residuals distribution is not normal. However, according to the Central Limit Theorem, if the number of statistical observations is more than 30 cases or the sample population is large, it is assumed that statistical distribution of residuals is near to the normal level [43]. Results of Autocorrelation Test, as the last classical hypothesis of regression model, are presented in Table 2. Value of Durbin-Watson statistic resulted from this test includes a confidence interval of 1.5 to 2.5 for all of the three models, which shows that there is no autocorrelation among residuals in all of the three models of the present study, and thus this hypothesis is the case with the models of this study. Before testing hypotheses of the study, Chow (F-Limmer) test and Hausman test were utilized to determine appropriate pattern of data. Results of the mentioned tests are presented in Table (3).

Table 3: Summary of results of Chow (F-Limmer) test and Hausman test

Models	Hausman Test			Chow Test		
	Elected Pattern	Prob. Chi-Sq	Chi-Sq. Statistic	Elected Pattern	Prob. F	F Statistic
Model 1	Fixed Effects	0.0000	100.1825	Pooled	0.0000	12.4515
Model 2	Fixed Effects	0.0000	33.8185	Pooled	0.0000	8.2725
Model 3	Fixed Effects	0.0000	98.5736	Pooled	0.0000	12.4510

Significance level of F Statistic resulted from Chow test (which is less than 5 percent) indicates that intercept the whole models of the present study are homological and the pattern type of the data is pooled. Furthermore, value of probability of Chi-Square resulted from Hausman test is less than 5 percent for all of the three models, which shows that pattern of the whole models of the present study follows fixed effects.

Summary of results of testing hypothesis 1 of the present study are presented in Table (4).

Table 4: Summary of results of testing hypothesis 1 of the study

$NCSKEW_{i,t}= \beta_0+\beta_1 DISQ_{i,t-1}+\beta_2 SIZE_{i,t-1}+\beta_3 ROA_{i,t-1}+\beta_4 LEV_{i,t-1} + \beta_5 MTB_{i,t-1} + \beta_6 CONSERVE_{i,t-1} +\varepsilon_{i,t}$

Title of Variables	Coefficient	t-value	Error Level
Intercept	3.0902	4.5736	0.0000
Disclosure Quality	-0.6893	-2.9804	0.0030
Firm Size	-0.2464	-2.6379	0.0086
Return on Assets	-0.6152	-1.1276	0.2600
Financial Leverage	0.7771	0.9777	0.3286
Market Value to Book Value of Equity	-0.1459	-3.4224	0.0007
Conservatism	-0.7850	-1.7278	0.0846
F Statistic	5.0807	R^2	0.0505
(Prob.)	(0.0000)		
Durbin-Watson Statistic	1.7601	R^2 adj.	0.0406

As seen in Table 4, value of F Statistic is (5.080) and its probability is (0.0000) which are indicative of the significance of the total model. Furthermore, value of R2 adj. shows that 4.06 percent of changes of the dependent variable (that is, future stock price crash risk) can be explained by the independent variable as well as other regressors. Furthermore, value of Durbin-Watson statistic is located within the limit of 1.5 to 2.5, which shows that there is no autocorrelation among residuals. Considering the Error Level estimated for the correlation coefficient of the variable of Disclosure Quality which is less than 5 percent, hypothesis 1 of the present study concerning the significant effect of Disclosure Quality on Future Stock Price Crash Risk is accepted.

Summary of the results obtained from testing hypothesis 2 of the present study are presented in Table (5).

As seen in Table 5, value of F Statistic is (17.0342) and its probability is (0.0000) which are indicative of the significance of the total model. Furthermore, value of R2 adj. shows that 12.16 percent of changes of the dependent variable (that is, disclosure quality) can be explained by the independent variable as well as other regressors. Furthermore, value of Durbin-Watson statistic is located within the limit of 1.5 to 2.5, which shows that there is no autocorrelation among residuals. Considering the Error Level estimated for the correlation

coefficient of the variable of Auditing Firm's Industry Specialization which is less than 5 percent, hypothesis 2 of the present study concerning the significant effect of Auditing Firm's Industry Specialization on Disclosure Quality is accepted.

Table 5: Summary of results of testing hypothesis 2 of the study

$DISQ_{i,t} = \beta_0+\beta_1 SPECIALIST_{i,t}+\beta_2 ROA_{i,t}+\beta_3 LEV_{i,t}+\beta_4 BIG_{i,t}+\beta_5 REC_{i,t}+ \varepsilon_{i,t}$

Title of Variables	**Coefficient**	**t-value**	Sig. Level
Intercept	1.6387	41.6943	0.0000
Auditing Firm's Industry Specialization	0.0720	4.1454	0.0000
Return on Assets	-0.0878	-1.5758	0.1156
Financial Leverage	-0.0770	-0.7844	0.4331
Auditing Firm Size	0.1201	6.3894	0.0000
Firm's Records of Acceptance in Stock Exchange	-0.1450	4.4812	0.0000
F Statistic	17.0342		
		R^2	0.1292
(Prob.)	(0.0000)		
Durbin-Watson Statistic	1.7562	R^2 adj.	0.1216

Summary of the results obtained from testing hypothesis 3 of the present study are presented in Table (6).

Table 6: Summary of results of testing hypothesis 3 of the study

$NCSKEW_{i,t}= \beta_0+ \beta_1 DISQ_{i,t-1}+ \beta_2 SPECIALIST_{i,t-1}+ \beta_3(DISQi_{,t-1}*SPECIALIST_{i,t-1})+ \beta_4 SIZEi_{,t-1}+\beta_5 ROA_{i,t-1}+ \beta_6 LEV_{i,t-1}+\beta_7 MTB_{i,t-1}+\beta_6 CONSERVE_{i,t-1}+\varepsilon_{i,t}$

Title of Variables	**Coefficient**	**t-value**	Sig. Level
Intercept	1.7655	2.0755	0.0384
Disclosure Quality	-0.5920	-2.3272	0.0197
Auditing Firm's Industry Specialization	-0.2719	-2.5060	0.0128
Disclosure Quality× Auditing Firm's Industry Specialization	-0.9893	-2.1165	0.0257
Firm Size	-0.0848	-0.8832	0.3775
Return on Assets	-0.6691	-1.2008	0.2303
Financial Leverage	0.7299	0.9150	0.3606
Market Value to Book Value of Equity	-0.0870	-1.9580	0.0570
Conservatism	-0.4731	-1.0049	0.3154
F Statistic	9.0806		
		R^2	0.2155
(Prob.)	0.0000		
Durbin-Watson Statistic	1.8505	R^2 adj.	0.1918

As seen in Table 6, value of F Statistic is (9.0806) and its probability is (0.0000) which are indicative of the significance of the total model. Furthermore, value of R2 adj. shows that 19.18 percent of changes of the dependent variable (that is, Future Stock Price Crash Risk) can be explained by the independent variable as well as other regressors. Furthermore, value of Durbin-Watson statistic is located within the limit of 1.5 to 2.5, which shows that there is no autocorrelation among residuals. Considering the Error Level estimated for the correlation coefficient of the moderating variable (that is, Disclosure Quality × Auditing Firm's Industry Specialization) which is less than 5 percent, hypothesis 3 of the present study concerning the significant effect of Auditing Firm's Industry Specialization on the relationship between Disclosure Quality and Future Stock Price Crash Risk is accepted.

6. Conclusions & Discussion

As mentioned in the introduction section, industry-specialized auditors can provide more appropriate modifying measures by providing better consultation and guidance with respect to the method of preparing and disclosing information in order to eliminate problems of the procedures of accounting and financial reporting, and further provide conditions to decrease stock price crash risk by increasing quality of financial information [44]. Accordingly, due to the fact that no study has been carried out in Iran to specifically investigate the relationship between disclosure quality and future stock price crash risk with the moderating factor of tax avoidance, the present study aimed at finding an appropriate answer for the question whether or not level of auditing firm's industry specialization has a significant effect on the relationship between disclosure quality and future stock price crash risk of the firms accepted in Tehran Stock Exchange.

As seen in the results of testing hypothesis 1 of the study, increase of disclosure quality of the financial statements can significantly result in a decrease of future stock price crash risk. More specifically, by a one-percent increase of disclosure quality of the financial statements, future stock price crash risk will be decreased by a 68-percent degree. These findings are in the same line with those of the research studies in [45,46,47]. Results of hypothesis 2 are indicative of the fact that auditing firm's industry specialization can significantly increase disclosure quality of the financial statements. To be more concise, by a one-percent increase of auditing firm's industry specialization, disclosure quality of financial statements will be increased by a 7.2-percent degree. Findings of this hypothesis, indicating the fact that high-quality auditors are the best experts to uncover bad news and to improve the quality of financial statements because of their greater capability (e.g., training and experience), are consistent with the principles of Agency Theory as well as the findings of the studies conducted by [48,49,50].

Finally, results of hypothesis 3, which was defined to answer the main question of the study, indicate that auditing firm's industry specialization can significantly result in the intensification of the negative relationship between disclosure quality and future stock price crash risk. In other words, auditing firm's industry specialization can lead to an increase in the quality of financial statements, and finally in a decrease of future stock price crash risk. Generally speaking, findings of the present study are in the same line with those of [51,52,53,54]. In the end, it can be concluded that high-quality industry-specialized auditors, for such reasons as their greater capability (e.g., training and experience), preserving their reputation and lowering their liability,

have stronger incentives to ensure timely disclosure of bad news and suppress managers' bad news hoarding activities, which in turn would result in the decrease of future stock price crash risk.

7. Limitations of the Study

Like most of the other research projects, the present study has had some limitations as what follows:

1. Most of the firms accepted in Tehran Stock Exchange did not continuously present their monthly return which resulted in exclusion of most firms from the sample population of the present study due to impossibility of estimating their monthly specific return. This resulted in a limited sample population.

2. Due to the lack of transaction of stock related to some firms accepted in Tehran Stock Exchange, which have been probably the factor involved in stock index crash, estimating their monthly specific return were impossible and thus they were excluded from the sample population of the study. It is expected that this limitation has had a statistically significant effect on the results of the study.

8. Applied Suggestions

According to the results obtained from testing the hypotheses of the study concerning the effect of the auditing firm's industry specialization on decrease of the future stock price crash risk, the following suggestions are presented:

1. The auditing firms are suggested to increase the specialty level of their auditors by providing them with a professional and appropriate education as well as delegating the projects related to each industry to the auditing teams specialized in the respective industry.

2. In order to execute auditing on the financial statements of their firms, the Managers and Board of Directors of the firms accepted in Tehran Stock Exchange are suggested to select the independent auditors from among those auditors who have a more market share (specialty) in their industry.

References

[1] A.P. Hutton, A.J. Marcus, & H. Tehranian. "Opaque financial reports, R2, and crash risk." Journal of Financial Economics, vol. 94, pp. 67-86, 2009.

[2] H.I. Wolk, J.L. Dodd, & M.G. Tearney. (2014). Accounting theory 1 (G. Karami & K. Tajik, Trans.). Tehran: Nagah-e Danesh Publication. (Original work published 1942).

[3] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[4] L.E. De Angelo. "Auditor size and audit quality." Journal of Accounting and Economics, vol. 3, pp. 183-99, 1981.

[5] I.K. Khurana, & K.K. Raman. “Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries.” The Accounting Review, vol. 79 (2): pp. 473-495, 2004.

[6] A.T. Craswell, J.R. Francis, & S.L. Taylor. “Auditor brand name reputations and industry specializations.” Journal of Accounting and Economics, vol. 20, pp. 297-322, 1995.

[7] I. Solomon, M.D. Shields, & O.R. Whittington. “What do industry-specialist auditors know?” Journal of Accounting Research, vol. 37, pp. 191-208, 1999.

[8] M. Kend. “Client industry audit expertise: Towards a better understanding.” Pacific Accounting Review, vol. 20, pp. 49-62, 2008.

[9] B. Mayhew, & M.S. Wilkins. “Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public.” Auditing: A Journal of Practice and Theory, vol. 22 (2), pp. 33–52, 2003.

[10] C.E. Hogan, & D.C. Jeter. “Industry specialization by auditors.” Auditing: A Journal of Practice & Theory, vol. 18, pp. 1-17, 1999.

[11] J. Chen, H.J. Hong, & J. Stein. “Forecasting crashes: Trading volume, past returns, and conditional skewness in stock price.” Journal of Financial Economics, vol. 61, pp. 345-381, 2001.

[12] D.S. Jenkins, G.D. Kane, & U. Velury. “Earnings quality decline and the effect of industry specialist auditors: An analysis of the late 1990s.” Journal of Accounting and Public Policy, vol. 25, pp. 71-90, 2006.

[13] A.P. Hutton, A.J. Marcus, & H. Tehranian. “Opaque financial reports, R2, and crash risk.” Journal of Financial Economics, vol. 94, pp. 67-86, 2009.

[14] A.J. Robin, & H. Zhang. “Do industry-specialist auditors influence stock price crash risk?” Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[15] L.E. De Angelo. “Auditor size and audit quality.” Journal of Accounting and Economics, vol. 3, pp. 183-99, 1981.

[16] I.K. Khurana, & K.K. Raman. “Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries.” The Accounting Review, vol. 79 (2): pp. 473-495, 2004.

[17] M. Namazi, A. Bayazidi, & S. Jabbarzadeh Kangarlouei. “An investigation of the relationship between audit quality and earning management of firms listed in Tehran Stock Exchange.” Journal of Accounting & Auditing Studies, vol. 9, pp. 4-21, 2011.

[18] D. Foroughi, H. Amiri, & M. Mirzaei. "The effect of non-transparency of financial information on future stock price crash risk in firms listed in Tehran Stock Exchange." Journal of Financial Accounting Studies, vol. 4, pp. 15-40, 2011.

[19] A.P. Hutton, A.J. Marcus, & H. Tehranian. "Opaque financial reports, R2, and crash risk." Journal of Financial Economics, vol. 94, pp. 67-86, 2009.

[20] M.A. Aghaei, & M. Nazemi Ardekani. "Auditor's industry specialization and voluntary accruals management." Journal of Accounting Knowledge, vol. 46, pp. 4-17, 2012.

[21] A. Ahmadpour, M.J. Zare, & K. Heidari Rostami. "An investigation of the effect of firm's features on stock price crash risk of the firms accepted in Tehran Stock Exchange." Quarterly of Stock Exchange, vol. 28, pp. 29-45, 2014.

[22] M.H. Vadiei Noghani, & A. Rostami. "An investigation of the effect of type of institutional ownership on future stock price crash risk in firms listed in Tehran Stock Exchange." Science & Research Quarterly of Financial Accounting, vol. 3, pp. 43-66, 2014.

[23] N. Sarikhani, & E. Barzegar. "Analysis of the relationship between audit quality and restatement of financial statements resulted from earning management and cash management in firms listed in Tehran Stock Exchange." Science & Research Quarterly of Financial Accounting, vol. 29, pp. 103-131, 2016.

[24] J. Myers, L. Myers, & T. Omer. "Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation?" The Accounting Review, vol. 78 (3), pp. 779-799, 2003.

[25] L. Jin, & S. Myers. "R2 around the world: New theory and new tests." Journal of Financial Economics, vol. 79 (2), pp. 257–292, 2006.

[26] F. Hakim, M.A. Omri, & I. Hakim. "Audit quality and equity liquidity, some evidence on the role of auditor tenure and auditor industry specialization in Tunisian context." Journal of Business Continuity and Risk Management, vol. 1 (2), pp. 151-165, 2010.

[27] J. Kwong. "The relationship between industry specialization and the audit fee premium in New Zealand." International Journal of Business and Social Science, vol. 2 (4), pp. 260-278, 2011.

[28] J.L. Callen, & X. Fang. (2015). "Short interest and stock price crash risk." Journal of Banking & Finance, DOI: http://dx.doi.org /10.1016/j.jbankfin.2015.08.009

[29] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[30] B. Mayhew, & M.S. Wilkins. "Audit firm industry specialization as a differentiation strategy:

Evidence from fees charged to firms going public." Auditing: A Journal of Practice and Theory, vol. 22 (2), pp. 33–52, 2003.

[31] J.R. Casterella, J.R. Francis, B.L. Lewis, & P.L. Walker. "Auditor industry specialization, client bargaining power, and audit pricing." Auditing: A Journal of Practice and Theory, vol. 23 (1), pp. 123-140, 2004.

[32] K. Chen, L.K. Lin, & J. Zhou. (2005). "Audit quality and earnings management for Taiwan IPO firms." Managerial Accounting Journal, vol. 20 (1), pp. 86-104, 2005.

[33] A.P. Hutton, A.J. Marcus, & H. Tehranian. "Opaque financial reports, R2, and crash risk." Journal of Financial Economics, vol. 94, pp. 67-86, 2009.

[34] M.T. Bradshaw, A.P. Hutton, A.J. Marcus, & H. Tehranian. (2010). "Opacity, crashes, and the option smirk curve." [On-line] Available: http://www.ssrn.com [2017]

[35] J.B. Kim, Y. Li, & L. Zhang. "CFOs versus CEOs: Equity incentives and crashes." Journal of Financial Economics, vol. 101, pp. 713-730, 2011.

[36] J.L. Callen, & X. Fang. (2011). "Institutional investors and crash risk: Monitoring or expropriation?" [On-line] Available: http://www.ssrn.com [2017]

[37] P.C. Andreou, C. Antoniou, J. Horton, & C. Louca. (2012). "Corporate governance and stock price crashes." [On-line] Available: http://www.ssrn.com [2017]

[38] P.C. Andreou, C. Antoniou, J. Horton, & C. Louca. (2013). "Corporate governance and firm-specific stock price crashes." [On-line] Available: http://www.ssrn.com [2017]

[39] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[40] D. Givoly, & C. Hayn. (2000). "The changing time series of earning, cash flow and accruals: Has financial reporting become more conservative?" Journal of Accounting and Economics, vol. 29, pp. 287-320, 2000.

[41] M.H. Setayesh, & M. Kazemnejad. "Identification of factors effective on quality of information disclosure of firms accepted in Tehran Stock Exchange." Journal of Accounting Advances of Shiraz University, vol. 1, pp. 49-79, 2012.

[42] M.H. Setayesh, & M. Kazemnejad. "Identification of factors effective on quality of information disclosure of firms accepted in Tehran Stock Exchange." Journal of Accounting Advances of Shiraz University, vol. 1, pp. 49-79, 2012.

[43] A. Aflatooni. Statistical analysis using Eviews in accounting and financial management studies (2nd Ed.). Tehran: Termeh Publications, 2015.

[44] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[45] D. Foroughi, H. Amiri, & M. Mirzaei. "The effect of non-transparency of financial information on future stock price crash risk in firms listed in Tehran Stock Exchange." Journal of Financial Accounting Studies, vol. 4, pp. 15-40, 2011.

[46] L. Jin, & S. Myers. "R2 around the world: New theory and new tests." Journal of Financial Economics, vol. 79 (2), pp. 257–292, 2006.

[47] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[48] L.E. De Angelo. "Auditor size and audit quality." Journal of Accounting and Economics, vol. 3, pp. 183-99, 1981.

[49] I.K. Khurana, & K.K. Raman. "Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries." The Accounting Review, vol. 79 (2): pp. 473-495, 2004.

[50] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.

[51] L.E. De Angelo. "Auditor size and audit quality." Journal of Accounting and Economics, vol. 3, pp. 183-99, 1981.

[52] I.K. Khurana, & K.K. Raman. "Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries." The Accounting Review, vol. 79 (2): pp. 473-495, 2004.

[53] A.P. Hutton, A.J. Marcus, & H. Tehranian. "Opaque financial reports, R2, and crash risk." Journal of Financial Economics, vol. 94, pp. 67-86, 2009.

[54] A.J. Robin, & H. Zhang. "Do industry-specialist auditors influence stock price crash risk?" Auditing: A Journal of Practice & Theory, vol. 34 (3), pp. 47-79, 2015.