Examining the Impact of Market Reaction Pattern, Managerial Ability, and Corporate Governance on Tax Avoidance in Companies Listed on the Tehran Stock Exchange

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Abstract

The primary objective of this study is to examine the impact of the market reaction pattern, managerial ability, and corporate governance on tax avoidance in companies listed on the Tehran Stock Exchange. This research is applied in nature and employs a quasi-experimental, post-event approach within the field of positive accounting research. It utilizes multivariate linear regression and econometric models for analysis. To test the hypotheses, the significance of each regression coefficient was examined using the t-test. The final data analysis was conducted using Excel (2019) and Eviews (10) software. The findings from the hypotheses indicated that tax avoidance has a significant impact on the risk of future stock price crashes. Furthermore, market reaction moderates the impact of tax avoidance, discretionary accruals, and financial constraints on the risk of future stock price crashes. Additionally, managerial ability moderates the impact of financial constraints on the risk of future stock price crashes. Corporate governance moderates the impact of tax avoidance and discretionary accruals on the risk of future stock price crashes. The results showed that managerial ability does not moderate the impact of tax avoidance, discretionary accruals, or financial constraints on the risk of future stock price crashes.

Keywords: *market reaction, managerial ability, corporate governance, tax avoidance, Tehran Stock Exchange*

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1. Introduction

Taxation is a strategic, foundational, and dynamic issue that plays a fundamental and pivotal role in the realization of national development programs in any country, including Iran. Today, beyond its primary role of covering part of the government's expenses, taxation is considered a significant lever in implementing the government's expansionary and contractionary policies in budgeting various sectors. Furthermore, tax is the most important source of public revenue and one of the most effective tools of fiscal policy globally, through which governments provide numerous social and welfare services to the public [1].

Reliance on tax revenues provides a sustainable and endogenous national revenue source for the government. There have always been attempts to use mechanisms that understate a company's profit or overstate its expenses to reduce tax liabilities [2]. Tax avoidance is among the challenges stemming from tax laws and regulations, and this is more common among corporate income taxpayers, as they represent a large portion of government tax revenues [3]. Currently, tax auditors face challenges in identifying and collecting taxes from individuals who successfully evade correct tax payments. To address this challenge, tax auditors are equipped with limited resources and traditional, time-consuming auditing strategies [4].

Tax avoidance is defined as the legal use of the tax system to benefit from reducing payable taxes using instruments embedded within the law itself [5]. Since tax avoidance is a seemingly legal activity, it is more visible compared to tax evasion. Tax avoidance is primarily focused on exploiting specific tax benefits, and there are generally fewer restrictive laws to control it [6]. As a result, many companies are likely involved in tax avoidance, making it crucial to determine the factors influencing tax avoidance levels within companies. The establishment of corporate governance mechanisms can direct tax avoidance activities toward maximizing the wealth of capital market participants, as corporate governance focuses on the board of directors, whose responsibility is to maximize shareholder wealth. On the other hand, there is a view that tax avoidance can serve as a tool for increasing shareholder wealth. It is expected that stronger corporate governance mechanisms will correlate with higher tax avoidance. Companies that have experienced higher tax avoidance tend to have higher stock prices in the market. This result can be justified by the fact that these companies, through tax avoidance and lower tax payments, aim to increase company and owner capital gains, thereby sending a positive signal to the market [7-9].

Conversely, the establishment of a robust corporate governance system can enhance control activities and reduce the risks associated with tax evasion. Moreover, if management has a high capacity for effectively running the business, the policies adopted could maximize business profitability for sustainability [10-13]. In this case, the necessity for tax avoidance to meet shareholders' expected profit levels would be diminished, as recent studies have shown that company managers, as a significant human capital, play a crucial role in converting company resources into revenue and creating wealth for shareholders [14]. Information related to managerial capabilities, such as their ability to exploit investment opportunities, secure resources, allocate resources optimally, and their knowledge and experience, is considered a vital and valuable dimension of a company's intangible assets [15].

In essence, managerial ability can be considered a part of company efficiency that is not influenced by the company's inherent factors. Managers with higher innate ability possess a greater understanding and analytical capacity regarding the current and future conditions of the company and industry. High-ability managers should have more relevant knowledge, better information, and a clearer understanding of the industry environment. Competent managers can significantly increase the company's future value through strategic decision-making and operational planning [16].

There are diverse views regarding the relationship between managerial ability and tax evasion. Some believe that competent managers, who effectively control resources and are motivated to maximize profit, often make decisions that reduce income tax payments. Others argue that competent managers avoid tax evasion due to ethical considerations or unsuitable conditions [17].

The market reaction pattern and tax avoidance analyze the economic behavior of individuals and firms in dealing with taxes and related costs. Consequently, governments and tax authorities must bear the costs of detecting and preventing tax avoidance, making it a significant and challenging issue to address. If the government fails to identify tax avoidance, public investments will be negatively affected due to reduced taxes and subsequent decreases in government revenues [18]. The statistics and insights generated by an efficient and fair tax system can serve as a scientific and software-based control tool to improve economic efficiency and transparency across various economic sectors of a country [19].

Moreover, in many developing countries, including Iran, the lack of adequate information and inefficiencies in the tax collection system enable many high-income professionals to evade paying taxes proportionate to their income, causing a significant loss of government revenue [5]. These factors assist policymakers in making better taxation decisions and improving their economic impacts. Therefore, this study addresses the question: Does the market reaction pattern, managerial ability, and corporate governance influence tax avoidance?

2. Methodology

This study is applied in nature and employs a quasi-experimental, post-event approach within the field of positive accounting research. It uses multivariate linear regression and econometric models for data analysis. To ensure the sample represents the target population appropriately, the systematic elimination method was used. The sample was selected based on the following four criteria:

- To maintain data homogeneity, the companies must be engaged in production activities.
- The companies must have been continuously active throughout the research period, with no stock trading suspensions exceeding six months.
- The companies must have been listed on the Tehran Stock Exchange before 2012.
- The companies must not have changed their financial reporting periods, and the necessary data must be available.

After applying all criteria, a total of ... companies remained as the filtered population, all of which were selected as the sample. Therefore, the observations span from 2012 to 2021, resulting in 1,250 firm-year observations. The significance of each regression coefficient (t-test) was used to test the hypotheses. If the t-statistic probability is less than 5%, the hypothesis is not rejected. Data analysis was performed using Excel (2019) and Eviews (10) software.

Panel data methods adjusted for industry-specific variables were used to fit the research models. A 95% confidence level was used for hypothesis testing and for examining the classical assumptions, including zero mean of error terms, normality of residuals, no autocorrelation among residuals, no multicollinearity between error terms and independent variables, and homoscedasticity of residuals.

The regression models for hypothesis testing are as follows:

$$SPCR_{it} = \alpha_0 + \beta_1 KZIR_{it} + \beta_2 DissACC_{it} + \beta_3 BTD_{it} + \beta_4 AR_{it} + \beta_5 MA_{it} + \beta_6 INST_{it} + \beta_7 X_{it} + \varepsilon_{it}$$

To test the first hypothesis, the following regression model is used:

$$SPCR_{it} = \alpha_0 + \beta_1 KZIR_{it} + \beta_2 DissACC_{it} + \beta_3 BTD_{it} + \beta_4 AR_{it} \times KZIR_{it} + \beta_5 AR_{it} \times DissACC_{it} + \beta_6 AR_{it} \times BTD_{it} + \beta_7 MA_{it} + \beta_8 INST_{it} + \beta_9 X_{it} + \varepsilon_{it}$$

To test hypotheses two through four, the following regression model is used:

$$SPCR_{it} = \alpha_0 + \beta_1 KZIR_{it} + \beta_2 DissACC_{it} + \beta_3 BTD_{it} + \beta_4 MA_{it} \times KZIR_{it} + \beta_5 MA_{it} \times DissACC_{it} + \beta_6 MA_{it} \times BTD_{it} + \beta_7 AR_{it} + \beta_8 INST_{it} + \beta_9 X_{it} + \varepsilon_{it}$$

To test hypotheses five through seven, the following regression model is used:

$$SPCR_{it} = \alpha_0 + \beta_1 KZIR_{it} + \beta_2 DissACC_{it} + \beta_3 BTD_{it} + \beta_4 INST_{it} \times KZIR_{it} + \beta_5 INST_{it} \times DissACC_{it} + \beta_6 INST_{it} \times BTD_{it} + \beta_7 AR_{it} + \beta_8 MA_{it} + \beta_9 X_{it} + \varepsilon_{it}$$

Finally, to test hypotheses eight through eleven, the following regression model is used:

2.1. Operational Definitions of Variables

2.1.1. Dependent Variable

Stock Price Crash Risk: In this study, stock price crash risk is the dependent variable, measured using three criteria: CRASH (stock price crash in the following year), NSCKEW (negative skewness of firm-specific returns in the following

year), and DUVOL (down-to-up volatility of firm-specific returns in the following year).

1. **Stock Price Crash**: Statistically, assuming the normal distribution of monthly firm-specific returns, normal fluctuations are those where the monthly firm-specific return falls within the mean plus or minus 3.09 standard deviations. Fluctuations beyond this range are considered abnormal. Companies experiencing negative fluctuations exceeding this boundary are considered to have experienced a stock price crash.
2. **Negative Skewness of Stock Returns**: Signs of a stock price crash emerge a year before the event, with one indicator being negative skewness in the company's stock returns. Companies that experienced negative skewness in the previous year are more likely to face a stock price crash in the future. Negative skewness measures the asymmetry in return distribution. It is calculated using the formula:

$$NCSKEW_{i,t} = \frac{-[N(N-1)^{\frac{3}{2}} \sum_{i=1}^{12} W_{j,\theta}^3]}{[(N-1)(N-2)(\sum W_{j,\theta}^2)^{\frac{3}{2}}}$$

3. **Down-to-Up Volatility**: This measures the asymmetry in volatility, with higher left skewness indicating greater down-to-up volatility. It is calculated using:

$$DUVOL_{i,t} = -\log((n_u - 1)\sum DOWNW_{j,\theta}^2)/(((n_d - 1)\sum UPW_{j,\theta}^2$$

2.1.2. Independent and Moderating Variables

Tax Avoidance: Tax avoidance is measured using the effective tax rate, calculated as:

$$BTD_{i,t} = \frac{Tax\ Expence}{Operating\ income}$$

where BTD is the effective tax rate, Tax Expense is the reported tax expense, and Operating Income is the operating income.

Market Reaction: Market reaction is determined using the absolute abnormal stock return, calculated using the adjusted market model, where the difference between actual and expected returns gives the abnormal return.

$$UE_{i,t} = R_{i,t} - R_{m,t}$$

Managerial Ability: Managerial ability is measured using company efficiency, incorporating firm-specific characteristics into a multivariate regression, with the residual representing managerial ability. Efficiency is calculated using:

$$Max\theta = \frac{Sales}{Gogs + SG\&A + Intatn + NetPPE}$$

where Sales is total sales, COGS is cost of goods sold, SG&A is selling, general, and administrative expenses, NetPPE is net property, plant, and equipment, and Intan is intangible assets.

Corporate Governance: Defined as the percentage of shares held by institutional shareholders or the company's free float percentage.

2.1.3. Control Variables

Control variables include financial leverage (Lev), company size (Size), return on assets (ROA), company age, and the book-to-market equity ratio.

3. Findings

The descriptive findings of the research are presented in Table 1.

Table 1. Descriptive Analysis of Research Data for the Entire Sample of Companies

Variable	Index	Symbol	Mean	Maximum	Minimum	Standard Deviation
Stock Price Crash Risk	Stock Price Crash	CRASH	0.04	1.00	0.00	0.20
	Negative Skewness of Stock Returns	NSCKEW	0.84	1.00	-1.00	0.37
	Down-to-Up Volatility of Returns	DUVOL	-0.69	2.65	-4.71	0.83
Tax Avoidance	Effective Tax Rate	BTD	0.03	0.14	-0.002	0.03
Market Reaction	Absolute Abnormal Stock Return	AR	-0.01	0.14	-0.26	0.05
Managerial Ability	Firm Ability	MA	-0.002	0.47	-0.70	0.16
Corporate Governance	Institutional Shareholders	INST	58.03	99.92	0.00	30.51
Financial Leverage	Financial Leverage	LEV	0.58	1.82	0.03	0.21
Firm Size	Size	SIZE	14.51	20.77	11.04	1.54
Return on Assets	Return on Assets	ROA	13.36	63.13	-58.11	14.82
Firm Age	Age	AGE	1.59	1.85	1.08	0.15
Book-to-Market Ratio	Book-to-Market Ratio	MTB	31.05	1336.5	-6016.4	195.5

Before hypothesis testing, the stability of the research variables was examined. Stability implies that the mean and variance of the research variables remain constant across different years, ensuring no spurious regression in the model. The Phillips-Perron test was used for this purpose, with the results shown in Table 2. The results indicate that the p-values for all variables were less than 5%, confirming the stability of all research variables over the study period.

Table 2. Normality Test Results

Index	Symbol	Test Statistic	P-Value
Stock Price Crash	CRASH	240.47	0.00
Negative Skewness of Stock Returns	NSCKEW	633.91	0.00
Down-to-Up Volatility of Returns	DUVOL	846.72	0.00
Tax Avoidance	BTD	358.58	0.00
Market Reaction	AR	973.79	0.00
Managerial Ability	MA	110.54	0.00
Corporate Governance	INST	436.38	0.00
Financial Leverage	LEV	322.58	0.001
Firm Size	SIZE	373.58	0.00
Return on Assets	ROA	328.85	0.001
Firm Age	AGE	2302.6	0.00
Book-to-Market Ratio	MTB	482.86	0.00

The first hypothesis states:

"Tax avoidance has a significant effect on the risk of future stock price crashes."

To measure the risk of future stock price crashes, three indices were used: stock price crash in the following year, negative skewness of firm-specific returns in the following year, and down-to-up volatility of firm-specific returns in the following year. The results from the estimation of the first model for testing the first hypothesis are presented in Table 3.

Table 3. Analysis Results of the First Model for Testing the First Hypothesis

Variable	Symbol	CRASH Coeff	Prob.	Result	NSCKEW Coeff	Prob.	Result	DUVOL Coeff	Prob.	Result
Tax Avoidance	BTD	-0.83	0.03	Confirmed	0.29	0.67	Rejected	0.28	0.94	Rejected
Market Reaction	AR	0.81	0.02	Confirmed	-0.67	0.04	Confirmed	8.32	0.00	Confirmed

Managerial Ability	MA	0.003	0.97	Rejected	-0.02	0.83	Rejected	-0.71	0.17	Rejected
Corporate Governance	INST	0.001	0.11	Rejected	-0.002	0.00	Confirmed	-0.002	0.69	Rejected
Financial Leverage	LEV	-	-	-	0.12	0.28	Rejected	0.39	0.42	Rejected
Firm Size	SIZE	-0.01	0.09	Rejected	-0.01	0.50	Rejected	0.25	0.09	Rejected
Return on Assets	ROA	-0.001	0.05	Confirmed	-0.001	0.67	Rejected	-0.03	0.02	Confirmed
Firm Age	AGE	0.25	0.00	Confirmed	0.02	0.93	Rejected	-5.79	0.01	Confirmed
Constant	C	0.18	0.14	Rejected	1.02	0.001	Confirmed	4.61	0.03	Confirmed
F-Statistic		2.06			2.43			4.63		
P-Value (F-Statistic)		0.01			0.01			0.00		
Durbin-Watson Statistic		2.21			1.87			2.49		
R-Squared		0.16			0.17			0.45		
Adjusted R-Squared		0.10			0.11			0.35		
White Test Statistic		1.10			0.65			1.24		
P-Value (White Test)		0.32			0.98			0.14		
Jarque-Bera Test Statistic		1671.5			105.21			4.45		
P-Value (Jarque-Bera Test)		0.00			0.00			0.11		

The results in Table 3 show that the F-statistic and its p-value for all three models are less than the critical value of 0.05, indicating that the models are statistically significant. The Durbin-Watson statistic falls between 1.5 and 2.5, suggesting no autocorrelation issues. The White test results indicate no heteroscedasticity problems. The Jarque-Bera test results show that only the residuals of the model using down-to-up volatility as the index are normally distributed. However, since the data set is large (greater than 30) and the other classical assumptions are met, the non-normality of residuals does not affect the results. The R-squared values for the models are 0.16, 0.17, and 0.45, with the model using down-to-up volatility having the highest explanatory power.

Regarding the first hypothesis, the results confirm that tax avoidance significantly affects the risk of future stock price crashes, as indicated by the CRASH index.

Hypotheses Two, Three, and Four:

The results of the second model used to test hypotheses two to four are presented in Table 4.

Table 4. Analysis Results of the Second Model for Testing Hypotheses Two to Four

Variable	Symbol	CRASH Coeff	Prob.	Result	NSCKEW Coeff	Prob.	Result	DUVOL Coeff	Prob.	Result
Tax Avoidance	BTD	-0.23	0.01	Confirmed	0.01	0.98	Rejected	4.22	0.00	Confirmed
Market Reaction × Financial Constraint	AR × KZR	0.002	0.01	Confirmed	-0.01	0.44	Rejected	0.06	0.02	Confirmed
Market Reaction × Discretionary Accruals	AR × DISSACC	0.004	0.96	Rejected	2.04	0.00	Confirmed	0.70	0.81	Rejected
Market Reaction × Tax Avoidance	AR × BTD	-0.21	0.65	Rejected	-18.88	0.003	Confirmed	112.04	0.00	Confirmed
Managerial Ability	MA	0.01	0.28	Rejected	-0.07	0.48	Rejected	-0.14	0.59	Rejected
Corporate Governance	INST	0.0002	0.11	Rejected	-0.002	0.00	Confirmed	-0.001	0.11	Rejected
Financial Leverage	LEV	0.03	0.01	Confirmed	0.08	0.37	Rejected	0.22	0.32	Rejected
Return on Assets	ROA	-0.0002	0.27	Rejected	-0.001	0.54	Rejected	0.002	0.43	Rejected
Firm Age	AGE	0.08	0.04	Confirmed	-0.02	0.90	Rejected	-0.36	0.01	Confirmed
Book-to-Market Ratio	MTB	-0.0002	0.00	Confirmed	0.001	0.10	Rejected	-0.002	0.01	Confirmed
Constant	C	0.13	0.06	Rejected	0.92	0.00	Confirmed	0.27	0.26	Rejected
F-Statistic		2.45			0.19			8.09		
P-Value (F-Statistic)		0.01			0.14			0.00		
Durbin-Watson Statistic		1.77			1.95			2.07		
R-Squared		0.13			0.16			0.33		
Adjusted R-Squared		0.11			0.12			0.29		
White Test Statistic		1.05			0.74			1.25		
P-Value (White Test)		0.40			0.88			0.16		
Jarque-Bera Test Statistic		1882.1			42.88			1.35		
P-Value (Jarque-Bera Test)		0.00			0.00			0.51		

The results in Table 4 indicate that for the second hypothesis, the interactive variable (Market Reaction × Tax Avoidance) has a p-value less than 0.05 for the NSCKEW and DUVOL indices, confirming the hypothesis that market reaction moderates the relationship between tax avoidance and the risk of future stock price crashes.

Regarding the third hypothesis, the interactive variable (Market Reaction × Discretionary Accruals) is significant for the NSCKEW index, supporting the hypothesis that market reaction moderates the relationship between discretionary accruals and the risk of future stock price crashes.

Lastly, for the fourth hypothesis, the interactive variable (Market Reaction × Financial Constraint) is significant for the CRASH and DUVOL indices, confirming that market reaction moderates the relationship between financial constraint and the risk of future stock price crashes.

Hypotheses Five, Six, and Seven

The results of the third model estimation for testing Hypotheses Five to Seven are shown in Table 5.

Table 5. Analysis Results of the Third Model for Testing Hypotheses Five, Six, and Seven

Variable	Symbol	CRASH Coeff	Prob.	Result	NSCKEW Coeff	Prob.	Result	DUVOL Coeff	Prob.	Result
Tax Avoidance	BTD	-0.27	0.004	Confirmed	-0.04	0.94	Rejected	2.31	0.00	Confirmed
Managerial Ability × Financial Constraint	MA × KZR	-0.001	0.02	Confirmed	0.002	0.29	Rejected	-0.01	0.01	Confirmed
Managerial Ability × Discretionary Accruals	MA × DISSACC	0.02	0.42	Rejected	0.05	0.80	Rejected	-0.36	0.46	Rejected
Managerial Ability × Tax Avoidance	MA × BTD	0.17	0.42	Rejected	0.50	0.79	Rejected	2.51	0.56	Rejected
Market Reaction	AR	0.20	0.001	Confirmed	-0.98	0.00	Confirmed	8.55	0.00	Confirmed
Corporate Governance	INST	0.0001	0.37	Rejected	-0.002	0.00	Confirmed	-0.001	0.09	Rejected
Financial Leverage	LEV	0.05	0.004	Confirmed	0.02	0.80	Rejected	0.27	0.10	Rejected
Return on Assets	ROA	-0.0001	0.54	Rejected	-0.002	0.08	Rejected	0.004	0.046	Confirmed
Firm Age	AGE	0.06	0.02	Confirmed	-0.04	0.79	Rejected	-0.33	0.00	Confirmed
Book-to-Market Ratio	MTB	-0.0002	0.00	Confirmed	0.001	0.16	Rejected	-0.001	0.35	Rejected
Constant	C	-0.09	0.03	Confirmed	1.002	0.00	Confirmed	-0.25	0.17	Rejected
F-Statistic		3.37			2.91			42.81		
P-Value (F-Statistic)		0.00			0.001			0.00		
Durbin-Watson Statistic		1.72			1.97			2.01		
R-Squared		0.17			0.15			0.73		
Adjusted R-Squared		0.12			0.10			0.71		
White Test Statistic		1.04			0.76			1.13		
P-Value (White Test)		0.42			0.86			0.28		
Jarque-Bera Test Statistic		1271.9			41.25			0.34		
P-Value (Jarque-Bera Test)		0.00			0.00			0.84		

The results in Table 5 indicate that for Hypothesis Five, the interaction variable (Managerial Ability × Tax Avoidance) has a p-value greater than the critical value of 0.05 in all three models. Therefore, Hypothesis Five, which posits the moderating role of managerial ability in the relationship between tax avoidance and the risk of future stock price crashes, is not confirmed at the 95% confidence level.

In contrast, for Hypothesis Seven, the p-value of the interaction variable (Managerial Ability × Financial Constraint) is less than 0.05 in the models corresponding to the CRASH and DUVOL indices. Therefore, Hypothesis Seven, which states the moderating role of managerial ability in the relationship between financial constraint and the risk of future stock price crashes, is confirmed.

Regarding Hypothesis Six, the t-test p-value for the interaction variable (Managerial Ability × Discretionary Accruals) is also greater than 0.05 in all three models. Thus, Hypothesis Six, which suggests the moderating role of managerial ability in the relationship between discretionary accruals and the risk of future stock price crashes, is rejected at the 95% confidence level.

Hypotheses Eight, Nine, and Ten

The results of the fourth model estimation for testing Hypotheses Eight, Nine, and Ten are shown in Table 6

.

Table 6. Analysis Results of the Fourth Model for Testing Hypotheses Eight, Nine, and Ten

Variable	Symbol	CRASH Coeff	Prob.	Result	NSCKEW Coeff	Prob.	Result	DUVOL Coeff	Prob.	Result
Tax Avoidance	BTD	0.04	0.79	Rejected	3.15	0.002	Confirmed	8.13	0.00	Confirmed
Corporate Governance × Financial Constraint	INST × KZR	0.00002	0.91	Rejected	-0.00001	0.72	Rejected	-0.0001	0.30	Rejected
Corporate Governance × Discretionary Accruals	INST × DISSACC	0.001	0.01	Confirmed	0.003	0.01	Confirmed	0.0003	0.92	Rejected
Corporate Governance × Tax Avoidance	INST × BTD	-0.005	0.09	Rejected	-0.06	0.00	Confirmed	-0.09	0.00	Confirmed
Market Reaction	AR	0.20	0.002	Confirmed	-0.86	0.00	Confirmed	8.64	0.00	Confirmed
Managerial Ability	MA	-0.01	0.72	Rejected	-0.06	0.52	Rejected	-0.25	0.16	Rejected
Financial Leverage	LEV	0.08	0.001	Confirmed	0.001	0.98	Rejected	0.47	0.001	Confirmed
Return on Assets	ROA	0.001	0.71	Rejected	-0.001	0.54	Rejected	0.01	0.00	Confirmed
Firm Age	AGE	0.04	0.04	Confirmed	0.04	0.81	Rejected	-0.42	0.00	Confirmed
Book-to-Market Ratio	MTB	-0.0002	0.00	Confirmed	0.0004	0.32	Rejected	-0.001	0.24	Rejected
Constant	C	-0.08	0.01	Confirmed	0.78	0.005	Confirmed	-0.33	0.08	Rejected
F-Statistic		3.41			2.61			52.31		
P-Value (F-Statistic)		0.00			0.003			0.00		
Durbin-Watson Statistic		1.79			1.95			1.99		
R-Squared		0.17			0.14			0.76		
Adjusted R-Squared		0.12			0.09			0.75		
White Test Statistic		1.03			0.78			1.12		
P-Value (White Test)		0.43			0.84			0.30		
Jarque-Bera Test Statistic		1414.2			40.37			0.60		
P-Value (Jarque-Bera Test)		0.00			0.00			0.74		

The results in Table 6 indicate that for Hypothesis Eight, the interaction variable (Corporate Governance × Tax Avoidance) has a p-value less than 0.05 for the NSCKEW and DUVOL indices. Therefore, Hypothesis Eight, which posits the moderating role of corporate governance in the relationship between tax avoidance and the risk of future stock price crashes, is confirmed at the 95% confidence level.

For Hypothesis Nine, the t-test p-value for the interaction variable (Corporate Governance × Discretionary Accruals) is less than 0.05 for the CRASH and NSCKEW indices. Thus, Hypothesis Nine, which suggests the moderating role of corporate governance in the relationship between discretionary accruals and the risk of future stock price crashes, is also confirmed at the 95% confidence level.

However, for Hypothesis Ten, the p-value of the interaction variable (Corporate Governance × Financial Constraint) is greater than 0.05 in all three models. Therefore, Hypothesis Ten, which posits the moderating role of corporate governance in the relationship between financial constraint and the risk of future stock price crashes, is not confirmed at the 95% confidence level.

4. Discussion and Conclusion

Since shareholders are concerned with avoiding a decrease in their investments at the outset, the issue of stock price crashes is more significant and receives greater attention than stock price increases. Therefore, identifying factors that influence the risk of stock price crashes is essential. Tax avoidance and financial constraints are significant factors that can impact stock price crash risk. In this regard, it can be stated that when companies face financial constraints, they may decide to engage in tax avoidance to keep more funds within the company and reserve resources to mitigate future stock price crash risk. Thus, tax avoidance is expected to have a negative impact on future stock price crash risk. Tax avoidance refers to reducing direct taxes and is associated with positive book-tax differences and lower effective tax rates. Research presents two different perspectives on tax avoidance: one views tax avoidance as a strategy to reduce tax obligations and considers it value-enhancing for the company. The other perspective emphasizes the agency tension between managers and investors, suggesting that tax avoidance may

lead to inappropriate managerial behaviors, such as earnings manipulation. The findings of the study show that tax avoidance has a significant and negative inverse effect on stock price crash risk, supporting the first perspective and contradicting some other studies. The results of testing the first hypothesis, concerning the relationship between tax avoidance and stock price crash risk, confirm that tax avoidance significantly and negatively affects stock price crash risk. Therefore, the first perspective, which suggests that tax avoidance is value-enhancing for the company, is validated. This finding aligns with studies [5, 13, 20-23].

According to the literature, the commonality in the effects of tax avoidance, earnings management, and even financial constraints is the hoarding and accumulation of bad news by management for various reasons. Significant costs are also associated with tax planning and avoidance, as well as earnings manipulation and management. Bad news about tax avoidance and earnings manipulation by companies may trigger public outrage and accusations of not paying their fair share of taxes. Public perception of a company as tax-aggressive and manipulative may result in reputational risks and negative responses from customers and other stakeholders, potentially harming the company's value. This implies that stakeholders incorporate the ethical costs of tax planning and earnings manipulation into their consumption decisions. Accordingly, real stakeholders and consumers respond negatively to bad news related to tax planning, earnings management, and the hoarding of bad news, thereby moderating the effects of these factors on stock price crash risk.

The results for the second hypothesis, concerning the moderating role of market reaction in the relationship between tax avoidance and stock price crash risk, indicate that market reaction significantly affects the negative inverse relationship between tax avoidance and stock price crash risk (measured by negative skewness of firm-specific returns and down-to-up volatility). Specifically, for down-to-up volatility, market reaction moderates the negative effect of tax avoidance on crash risk, supporting the related literature. Furthermore, the results for the third hypothesis reveal that, as expected, market reaction positively moderates the relationship between earnings management and stock price crash risk. This means that market reaction amplifies the direct positive effect of earnings management on crash risk. This finding aligns with the literature, which suggests that stakeholders respond to bad news stemming from earnings manipulation by managers, reducing the company's value and increasing crash risk. Additionally, the results for the fourth hypothesis show that market reaction amplifies the direct effect of financial constraints on stock price crash risk. In other words, financial constraints, which increase crash risk through the hoarding of bad news and default risk, are exacerbated by market reaction, further raising crash risk. These findings are consistent with prior studies [4, 14, 15, 24, 25].

The hoarding and concealment of bad news by management can be used for personal gain, increasing the likelihood of information manipulation and, consequently, stock price crash risk. Some managers may behave opportunistically and transfer shareholder wealth to themselves. Tax avoidance and financial constraints enable managers to hide adverse news within the company, deceiving investors and shareholders. In these circumstances, bad news accumulates, creating an illusion of company quality. Eventually, when managers can no longer hide negative news, it culminates in a stock price crash. Thus, from the darker side of managerial ability, it can be argued that stock price crash risk increases for companies with more capable managers through the channel of inefficient investment. Overall, the moderating effect of managerial ability relies on two channels. The first is based on the positive impact of managerial ability on a company’s informational environment, where more capable managers provide higher quality earnings and are more likely to issue accurate profit forecasts. The second channel relates to increased external oversight, where a richer informational environment allows the market to monitor managerial decisions more effectively. Managerial ability is associated with greater analyst coverage and fewer forecast errors. More extensive analyst coverage and more accurate forecasts indicate more rigorous scrutiny of the company by analysts.

Regarding the fifth and sixth hypotheses on the moderating role of managerial ability in the relationships between tax avoidance and earnings management with stock price crash risk, the results show that managerial ability does not significantly affect these relationships. To explain these results, it can be argued that managerial ability may either increase crash risk through opportunism and the darker side of managerial behavior or reduce crash risk through an improved informational environment and external oversight. It appears there is no clear pattern among publicly traded companies in Iran, likely due to the coexistence of both views among managers.

Moreover, for the seventh hypothesis, concerning the moderating role of managerial ability in the relationship

between financial constraints and stock price crash risk, the results indicate a significant moderating effect. Specifically, financial constraints are less likely to lead to crash risk in companies with more capable managers. These managers are more successful at securing resources for investment in positive net present value projects, enhancing company value and reducing crash risk. These findings are consistent with prior studies [16, 17, 24, 26].

Concerns about job security, personal reputation, the value of discretionary allowances, and compensation schemes motivate managers to suppress bad news. However, strong corporate governance subjects managers to intense oversight, reducing their ability to accumulate bad news and, consequently, lowering crash risk. Thus, managers in well-governed companies are less likely to conceal bad news, resulting in lower future crash risk. The results of the eighth hypothesis confirm the moderating role of corporate governance in the relationship between tax avoidance and stock price crash risk. Specifically, corporate governance intensifies the negative inverse impact of tax avoidance on crash risk. In other words, strong corporate governance reduces crash risk by curbing bad news hoarding and minimizing the managerial time and potential detection risks associated with tax avoidance. Additionally, the findings support the ninth hypothesis, showing that corporate governance amplifies the effect of discretionary accruals on crash risk. This indicates that managers may leverage their relationships with board members and audit committees to enhance their power within the company. Thus, managerial influence may intensify the relationship between discretionary accruals and crash risk, highlighting the alignment of corporate governance indicators, such as board characteristics, with management. Finally, the results show that the tenth hypothesis, regarding the moderating role of corporate governance in the relationship between financial constraints and stock price crash risk, is not supported. This suggests that corporate governance does not significantly influence financial constraints, and it is management that may affect financial constraints. Given the influence and power of managers in publicly traded companies, corporate governance appears ineffective in mitigating bad news hoarding and default risk from financial constraints. Furthermore, the primary driver of financial constraint-related crash risk may be default risk, over which corporate governance has limited influence, as governance mainly focuses on monitoring management and bad news hoarding. These findings align with prior studies [5, 15, 20-23, 26, 27].

Based on the research findings, the following recommendations are made:

- Shareholders should implement measures to restrict managerial behavior, as the absence of proper mechanisms may lead to bad news hoarding, causing a significant drop in stock prices. Controlling opportunistic managerial behavior that results in concealing bad news can prevent future stock price crashes.
- The Tehran Stock Exchange is advised to establish mechanisms for assessing companies' financial constraints and provide solutions for mitigating these constraints through increased oversight.
- Investors and creditors should pay attention to indicators of potential future stock price crashes, such as high tax avoidance, discretionary accruals, and financial constraints in companies they intend to invest in.
- Given the role of market reaction in affecting factors related to stock price crash risk, companies should improve the quality of information disclosure to shape public perception positively and mitigate crash risk.
- To control opportunistic managerial behavior and protect shareholders from losses, companies should establish a permanent committee to monitor managerial actions, ensuring efficient resource use and preventing resource waste.
- Regarding corporate governance, it is noted that institutional investors often prioritize profit maximization. Thus, the Tehran Stock Exchange should emphasize privatizing companies.
- Lastly, investors should consider the extent of institutional shareholding and the expertise of institutional investors before deciding to invest in a company's stock.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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