IJAAF; Vol. 6, No. 2, Spring 2022, Serial 19

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

Religion, Cultural Elements and the Stock Price Crash Risk: a Test of Alternative and Complementary Theory

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How to cite this article:
Ghodrati Zoeram, A., Alifamian, M., Teymoorpoor, S. (2022). Religion, Cultural Elements and the Stock Price Crash Risk: a Test of Alternative and Complementary Theory. Iranian Journal of Accounting, Auditing and Finance, 6(2), 19-35. doi: 10.22067/ijaaf.2022.41611
URL: https://ijaaf.um.ac.ir/article_41611.html

ARTICLE INFO

Article History
Received: 2021-12-29
Accepted: 2022-03-31
Published online: 2022-05-07

Keywords:
Alternative and Complementary Theory, Culture, Religion, Stock Price Risk

Abstract

As one of the most critical issues widely discussed in financial studies, the stock price crash is affected by different factors. Despite the importance of this issue for shareholders and investors, the behavioral characteristics of managers responsible for preparing financial statements have not been considered recently. Among those characteristics, the religion and culture of management have been mentioned in this research. Accordingly, the study examines the effect of managers' religion (replacement or complementary effect) and culture on the stock price crash risk in companies listed consistently on the stock exchange until the end of 2019. Therefore, in order to measure the stock price crash risk, two criteria consisting of negative skewness of stock return and down-to-up volatility have been applied. Hofstede's (2001) questionnaire was used to measure culture, and Li and Cai (2016) model was used to measure religion. Then, the results were analyzed by using multivariate regression models. Findings indicate that among the dimensions of culture, the uncertainty avoidance dimension has a negative effect. The dimension of individualism positively affects the stock price crash risk. The dimensions, including power distance and masculinity, do not affect the stock price crash risk. The negative impact of uncertainty avoidance means that conservative risk-averse managers do not make decisions in uncertain conditions. Because they are less inclined to accumulate bad news, they might reduce the stock price crash risk. On the other hand, the positive effect of individualism on the stock price crash risk shows that individualistic managers who do not consult with others about their decisions and insist on their wrong decisions ignore the negative consequences of harmful investments with excessive trust in their decisions and lead to the accumulation of losses in the company and consequently increasing stock price crash risk. The results also show religion's negative and significant effect on the stock price crash risk. Religion reduces the risk of falling stock prices by reducing opportunism and agency problems. In addition, according to the complementarity theory, the sensitivity analysis results show that corporate governance exacerbates the negative relationship between religion and stock price crash risk of companies.

https://doi.org/10.22067/ijaaf.2022.41611

NUMBER OF REFERENCES
33

NUMBER OF FIGURES
1

NUMBER OF TABLES
12

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2588-6142
P-Issn: 2717-4131

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1. Introduction

The stock price crash risk shows the possibility of a sudden and sharp decline in stock prices, which indicates asymmetry in risk characteristics and is, therefore, an effective factor for investors' decision-making and risk management (Dang et al., 2017). The risk of falling stock price is an adverse event defined as severe negative stock returns. Such an event leads to a significant loss in investors' wealth and a decrease in investors' confidence in the capital market. The question of what factors make stock prices fall has attracted the attention of many researchers in recent years.

Some studies show that the negative fluctuations of stock price refer to the managers' behaviors in over-investing, which leads to high volatility and sharp price declines (Chen, Hong, and Stein, 2001; Hong and Stein, 2003). North (1990) and Williamson (2000) show that culture influences managers' behavior. Chui, Titman and Wei (2010) and Ferris, Jayaraman and Sabherwal (2013) confirm it. They state that individualism, a cultural dimension, positively affects the stock price crash risk.

On the other hand, regulatory mechanisms can also reduce the risk of a stock price crash in capital markets. Wei (2002) focuses significantly on the impact of the ethics and spirituality foundation in capital markets. They believe that the role of informal institutions (external oversight) in corporate governance cannot be ignored and is playing a more important role than expected. Chen et al. (2013) believe that religion, as an essential part of the informal environment, influences the people's belief in that country. Religion provides the basis for increasing production and subsequently improving the economy by creating suitable conditions (Chen et al., 2013).

The influence of economics on religious teachings is topic Western scholars have also considered. "Participation in religious denominations can reduce the risk of individuals by creating a good reputation and thus have a positive effect on efficiency and the optimal allocation of resources", Adam Smith states in his book titled "The Wealth of Nations". Also, as an extra-legal tool in exchanges, it reduces uncertainty and improves efficiency. Religious man, in economic activities, observes honesty, does not neglect his work and always strives to increase his productivity.

Religion is an important part of the organizational environment that significantly affects people's behavior. Callen and Fang (2013) were the first researchers who examined the impact of religion on stock price risk in the United States. But, it should be mentioned that Iran's religious environment is much different from that of the United States. Iranians pay more attention to the religious performance of the company; Therefore, the effect of religion on the stock price crash risk in Iran is predicted to be stronger than in the United States. Beliefs and public opinion, especially people's culture, can be reasons for this difference. On the other hand, the Iranian people are more involved in religious practices and choose a religion with a specific consensus. Another reason is the inherent difference between foreign religions and Iranian religious tendencies. Li and Cai (2016) examined the effect of religion on the risk of stock price decreases in China. They reveal that religion has an effective effect on reducing the risk of stock price falls. They state that religion significantly affects the stock price crash risk only when the quality of corporate governance and the legal environment are high. In fact, regarding Iran's religious and cultural environment, this study seeks to investigate the impact of religion and culture on the stock price crash risk.

2. Theoretical Framework and Literature Review

2.1. Culture and the Stock Price Crash Risk

Some previous studies point to stock price crashes due to investors' behavior in trading which leads to volatility and a sharp decline in prices (Chen, Hong and Stein, 2001; Hong and Stein, 2003). The fact that culture influences people's behavior is often overlooked. The culture affects how people analyze their attitudes, but it will also affect their decision-making (Williamson, 2000). There is no exception for managers in this rule. According to Hofstede's (2001) study, culture includes four

dimensions: uncertainty avoidance, power distance, individualism, and masculinity. People who have the characteristic of uncertainty avoidance are mainly trying to avoid unusual situations and avoid risk. These people are conservative and do not make decisions in situations of uncertainty. Managers with a culture of uncertainty avoidance avoid investing in high-risk projects and invest in high-reliability projects. On the other hand, because they are less tolerant of ambiguity, they are less inclined to accumulate bad news, reducing the stock price crash risk (Chen et al. 2015). The power distance is the other dimension of culture, which indicates the extent of individuals' participation in a society's decision-making. When the power distance is large, subordinates do not have an intimate relationship with managers, and conversely, when the power distance is short, subordinates have a close relationship with managers and participate in decision-making.

Another dimension of culture is individualism. Managers with a culture of individualism focus on internal characteristics like their own abilities and separate themselves from others. Dang et al. (2017) show a positive relationship between individualism and the stock price crash risk. It can be concluded that individualistic managers insist on their wrong decisions and always have too much confidence in their ability to invest in projects, which may ignore their negative feedback (Malmendier, Tate and Yan, 2011). Ahmed and Duellman (2013) show that over-confidence managers may overestimate the future returns of their firms' investments, delay the loss recognition and usually useless conservative accounting. Dang et al. (2017) also believe that individualism causes managers to hide bad news, ultimately leading to a stock price crash.

Another dimension of culture is masculinity. In patriarchal societies and organizations, the social role of individuals varies according to their gender. Powerful and violent roles and the emphasis on financial success are attributed to men. Some researchers conclude that by increasing masculinity in Iranian companies, their level of secrecy has decreased. In fact, according to their research, men are less likely to conceal company news and information; Therefore, it is predicted that managers who are patriarchal tend to accumulate bad news less, and as a result, it can be expected that with the increase in the level of masculinity in Iran, the stock price crash risk will decrease.

2.2. Religion and the Stock Price Crash Risk

Religion can be defined as the acceptance of all or part of religious beliefs, ethics, and rules so that a religious person considers himself obliged to follow and observe the previous-mentioned set. Religion as a kind of worldview is not only a criterion and judgement of individual and collective human behaviors, but also it is effective in shaping human behaviors. Since religion emphasizes the importance of moral behavior and forbids any abuse and opportunism, it can be a deterrent to the opportunistic behaviors of managers and their unwillingness to expose the company's bad news (Li and Cai, 2016; Callen and Fang, 2013). Xu et al. (2013) argue that managerial opportunism enables managers to hide bad news, and when negative accumulated information reaches a critical threshold, it suddenly enters the stock market and leads to a fall in stock prices.

Dyreng et al. (2012), El Ghoul et al. (2012) and Dang et al. (2017), and Chen et al. (2013) accordingly examine the impact of religion on information disclosure, stock prices, and earnings management. According to Callen and Fang's (2013) research, companies with firmer religious beliefs have lower stock price crash risk levels. Based on studies in the financial literature, the main reason for the stock price crash risk is the agency problem. According to the current theoretical literature, religion prevents the accumulation of bad news in two ways and consequently reduces the stock price crash risk of the company. Li and Cai (2016) claim that religious managers are more likely to institutionalize religious and moral norms in the company than other managers; therefore, they try to hide and distort company information less. Javers (2011) argue that since the rewards of managers depend on the reported profit and the disclosure of bad news also affects the company's profitability,

the potential costs of violating religious and social norms (e.g. loss of credibility, emotional damages and other social anomalies) in environments with a high level of religiosity due to the existing social norms in the environment of these companies prevent the accumulation of bad news by these managers. Thus, it is argued that the stock price crash risk in companies with religious directors is much lower than in other companies.

2.3. Literature review

ElMassah and Abou-El-Sood (2021) examine Islamic banking in culture regarding the role of gender and religion in an emerging market. Their purpose was to investigate the determinants of bank selection, especially in the multicultural Islamic banking sector. Results show that general consumer awareness significantly affects the choice of Islamic banking products. The positive effect of awareness is more significant for Muslim consumers than non-Muslims. Interestingly, social incentives and banking characteristics have little effect on Muslim and non-Muslim banking selections. Montenegro (2017) examines the religiosity and quality of financial reporting in Portugal. Her research shows a significant negative relationship between religiosity and earnings management of accruals and companies in areas with a higher level of religiosity and less involved in earnings management. She also argues that religiosity, along with other external monitoring methods, can be a mechanism for reducing aggressive accounting practices. Li, Wang and Wang (2017) examine the effect of institutional ownership on the relationship between social trust and the stock price crash risk in the Chinese capital market. Their research findings show a significant negative relationship between social trust and the stock price crash risk. In addition, when the model runs with institutional ownership as a mediator, the relationship between social trust and the stock price crash risk will be weaker. Dang et al. (2017) examine the relationship between culture and stock price crash risk. Their findings indicate firms' individualism is associated with higher stock price crash risk. They argue that individualism increases the stock price crash risk as a culture. Li and Cai (2016) investigate whether religion affects firm crash risk. They provide evidence that a manager's religiosity is significantly associated with reducing the problems of earnings management and risk management and finally leads to reducing the risk of stock prices crash. The results also show that the effects of religiosity are more pronounced with a higher quality of corporate governance mechanisms and reduce the stock price crash risk in Chinese companies. Du et al. (2015) investigate the relationship between religiosity and earnings management. They find that the significant negative association between religiosity and profit management is less pronounced for companies closer to Chinese regulatory centers. Chen et al. (2013) examine discretional accruals as the proxies for corporate governance and accounting misconduct and provide evidence representing a significant negative relationship between manager's religiosity and accounting misconduct and discretionary accruals.

According to the literature review, the conceptual model of this research is shown in Figure 1.

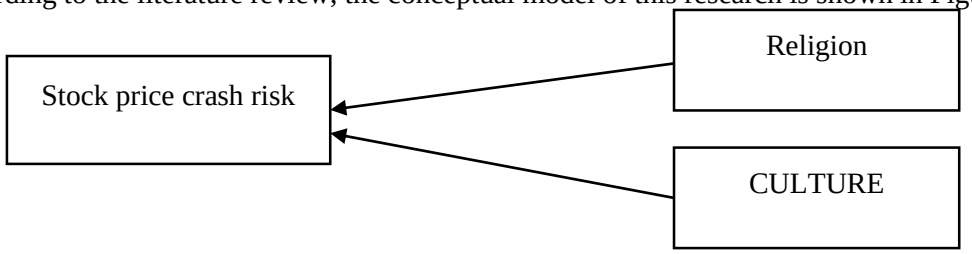

Figure 1. The conceptual model

According to the theoretical frameworks and literature, the research hypotheses are formulated as follows:

Hypothesis 1: There is a significant relationship between the dimensions of culture and the stock price crash risk.

Hypothesis 2: There is a significant relationship between religion and the stock price crash risk.

3. Research Methodology

This paper is causal-correlational, and in terms of methodology, it is quasi-experimental and retrospective in the realm of positive accounting studies carried out with real information. This paper is practical in terms of nature and objectives. The required data for the study are collected based on their types from different resources. The primary and raw information and data for hypothesis testing were collected using the information bank of the Tehran Stock Exchange, including Tadbir Pardaz compact disc, Rah Avard-e Novin, and the Codal website. The data relating to culture variables were also collected by distributing a questionnaire to the financial managers of companies. The statistical research population includes all companies listed consistently on the stock exchange from the beginning until the end of 2019. In order to extract a balanced panel of complete information, only companies with the following characteristics have been chosen as the sample.

1- In order to increase comparability, their fiscal year should be ended on March 31st.
2- They have not changed their activity or fiscal year during that relevant year.
3- They should not be in the "investment and financial intermediation" category.
4- The interruption period of transactions in these companies should not be more than three months.

After applying the aforementioned restrictions, 112 companies are selected as the research sample. Furthermore, the questionnaire is sent to the financial managers of considering companies. Finally, after many follow-ups, 64 questionnaires were completed and used as the final sample for analysis. The final analysis of the collected data is analyzed by using "Eviews econometrics software" and "SPSS software".

3.1. Variables and models

The variables in this study are as follows:

3.1.1. Dependent variable

The dependent variable is the stock price crash risk which is measured according to the research by Li, Wang and Wang (2017), Cao, Xia, and Chan (2016), and Li and Cai (2016), which use two measures: the first one is the negative stock skew (NCSKEW), which is calculated through Equation (1):

$$NCSKEW_{it} = -[n(n-1)^{\frac{3}{2}} \sum Wi,\theta\ 3] / [(n-1)(n-2)(\sum Wi,\theta\ 2)^{\frac{3}{2}}] \quad (1)$$

Where:

$W_{i,\theta}$: Company specific monthly return i in months θ and n: the number of monthly returns observed during the fiscal year. In this model, the higher the negative skewness coefficient, the more exposed the company to the stock price crash. The firm-specific monthly return is denoted by $W_{i,\theta}$ is equal to the natural logarithm of 1 plus the remaining number $\varepsilon_{i,\theta}$ calculated in Equation (2):

$$W_{i,\theta} = \ln(1+\varepsilon_{i,\theta}) \quad (2)$$

In the above equation:

$\varepsilon_{i,\theta}$: The residual return on Company i is in month θ, which is calculated from the residual values obtained from the estimation of the following model:

$$r_{i,\theta} = \alpha + \beta_{1i}\ r_{m,\theta-2} + \beta_{2i}\ r_{m,\theta-1} + \beta_{3i}\ r_{m,\theta} + \beta_{4i}\ r_{m,\theta+1} + \beta_{5i}\ r_{m,\theta+2} + \varepsilon_{i,\theta} \quad (3)$$

In the above equation:

$r_{i,\theta}$: return on shares of the company i in month θ, and $r_{m,t}$: Market returns in the month θ. To

calculate the monthly market return, the beginning of the month index is deducted from the end of the month index and the result is divided by the beginning of the month index. The second risk criterion for a stock price crash is down-to-up volatility (DUVOL), measured by calculating the average return of companies. The data are divided into two categories: below and above the average, and each category's standard deviation is calculated separately. Equation (4) is then used to calculate the bottom-up fluctuations:

$$DUVOL_{i,t} = log\ log\ \left(\frac{Down_{i,t}}{Up_{i,t}}\right) \quad (4)$$

wherein:

$Down_{i,t}$: Criterion deviation of observations below average, $Up_{i,t}$: The standard deviation of the observations is greater than the average for the specific return of company i in year t.

3.1.2. Independent variables

Culture: One of the independent variables in the current study is culture, which is measured by Hofstede's (2001) Cultural Attitudes Questionnaire. The questionnaire consists of 4 dimensions: avoiding uncertainty with 5 items, power distance with 6 items, individualism with 5 items, and masculinity/feminism with 9 items. They are on a 5-point Likert-type scale with response levels (completely Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree). In order to check the validity, the questionnaire is provided to experts and specialists in a related field based on their opinion. In addition, to evaluate the reliability and stability test of the questionnaire, Cronbach's alpha is calculated by using SPSS software. Cronbach's alpha coefficient for each item considered in "culture" in Table (1) shows that the questionnaire has sufficient and desirable reliability.

Table 1. Cronbach's alpha and number of questionnaire items

Items	Number of Items	Cronbach's alpha	Reference
uncertainty avoidance	5	8550.	Hofstede (2001)
power distance	6	9080.	Hofstede (2001)
Individualism	5	8500.	Hofstede (2001)
Masculinity	9	8550.	Hofstede (2001)

Religion: Another independent variable in this study is religion. It is regulated according to the theory of social norms predicting that they affect the behavior of individuals. The theory of social norms predicts that religious norms will influence the religiosity of managers in a local geographical area because the religious, social norms of local people are an important environmental element in which managers live and work. Religious norms in society play an important role in individuals' adherence to a social norm.

Managers of companies with high levels of religiosity located in areas of religious space have a higher level of religiosity than those in this area. In this study, according to the research of Du (2013), Du et al. (2014) and Li and Cai (2016), using the distance between the companies registered in the registry office with religious mosques, we investigate the extent of religious issues influence on stock price crash risk. The method of measuring religion in this study is first to determine the longitude and latitude of registered companies using Google Earth, then measure each company's geographical location according to their distance from the surrounding mosques, and finally lead to a measure of length. The latitude of the company and then the distance of each company with the places containing religious activities is checked based on the longitude and latitude (the length of the partial arc across the surface of the earth). In general, the religion index will be measured using the specified distances between the company's headquarters and the surrounding mosques within a radius of 100 km from

the address of the registered companies. This means that the greater the distance, the less managers are influenced by religion and according to Li and Cai's (2016) research, the shorter the distance of mosques located within a radius of 100 km around the company, the greater the religiosity of managers. In other words, the managers pay more attention to religious issues. Therefore, based on Li and Cai's (2016) study, the following equations are proposed:

$$cos\ cos\ \theta\ = sin\ sin\ lat_r\ \times sin\ sin\ lat_f\ + cos\ cos\ lat_r\ \times cos\ cos\ lat_f\ \times cos\ cos\ (lon_r - lon_f) \quad (5)$$

$$rad = (40075.04/360) \times (180/\pi) \quad (6)$$

$$d = rad \times (\frac{\pi}{2} - arctang\left(\frac{coscos\ \theta}{\sqrt{1-cos^2\theta}}\right) \quad (7)$$

Where (d) is the distance between the registered address of the company and the mosques around the company and lon_r , lat_r, lat_f lon_f are the longitude and latitude of geographical distances, respectively.

3.1.3. Control variables

In this study, some of the most important variables identified as factors affecting the stock price crash risk based on previous studies were considered as control variables, which are as follows:

Firm Size: Large companies are motivated to reduce their capital costs by increasing the quality of financial reporting and the information disclosure process to raise the funds they need. Therefore, large companies are less likely to accumulate and not disclose bad news, preventing the sudden entry of bad news into the market and reducing the stock price crash risk (Kim, Li and Zhang, 2011). Thus, this variable is used as a control variable. This study measures firm size by the logarithm of total firm assets (Li and Cai, 2016).

Financial Leverage: Khan and Watts (2009) and Cao, Xia, and Chan (2016) argue that there is more likely to sue in leverage companies, which may increase the likelihood of stock prices crashing. Accordingly, in the current study, financial leverage is considered a control variable, calculated by dividing the total debt by the book value of the company's total assets (Li and Cai, 2016).

Growth Opportunities: Companies with high growth opportunities have volatile stock returns and are more likely to experience large losses, increasing the likelihood of stock price crashes (Khan and Watts, 2009). Therefore, in this study, the ratio of market value to the book value of equity is considered a measure of growth opportunities and another control variable (Li and Cai, 2016).

Equity Rate of Return: In terms of profitability, profitable companies are expected to experience a lower risk of stock price crashes (Hutton, Marcus and Tehranian, 2009; Li and Cai, 2016). Therefore, in the current study, the return on equity is entered in the model as a measure of profitability and another control variable calculated by dividing net profit by the book value of equity.

Heterogeneity of Investors: The difference between the average random turnover of stocks during this year and last year is calculated. It is obtained by dividing the monthly trading volume by the total number of stocks issued during the month. This variable is used in the studies of Hong and Stein (2003), Cao, Xia, and Chan (2016) and Li and Cai (2016) as a potential factor influencing the stock price crash risk and the control variable.

3.2. Regression model

In order to test the research hypotheses, the following multivariate regression models discussed in Li and Cai (2016) and Dang et al. (2017) studies are used as follows:

Model No. (1): To test the first research hypothesis (effect of culture on stock price crash risk)

$CRASH_i = \beta_0 + \beta_1\ CULTURE_i + \beta_2\ SIZE_i + \beta_3\ LEV_i + \beta_4\ GWTH_i + \beta_5 ROE_i + \beta_6 DTURN_i + \varepsilon_i$

Model No. (2): To test the second research hypothesis (the effect of religion on the stock price

crash risk)

$$CRASH_i = \beta_0 + \beta_1 RELIGION_i + \beta_2 SIZE_i + \beta_3 LEV_i + \beta_4 GWTH_i + \beta_5 ROE_i + \beta_6 DTURN_i + \varepsilon_i$$

Where:

"CRASH" is each of two criteria for stock price crash risk; "CULTUREi" is the Index of Cultural Dimensions; "RELIGION" is religion (manager religiosity); "SIZE" is the firm size; "LEV" is corporate financial leverage; "GWTH" is growth opportunities; "ROE" is the rate of return on equity; "DTURN" is the investor heterogeneity, and "ε" is part of the regression model error.

Since these two criteria of negative stock skew coefficient (NCSKEW) and bottom-up fluctuations (DUVOL) are used to measure the stock price crash risk, the models mentioned above are estimated for each of the two criteria of stock price crash risk separately.

4. Research Findings

4.1. Demographics of respondents

In order to get acquainted with the characteristics of the statistical sample, the demographic profile of the respondents is presented in Table 2. The results show that all sample companies have a male manager; Also, most executives in companies have between 40 and 50 years old. Regarding the work experience of managers, about 30% of managers are less than 10 years and 70% of them have more than 10 years of experience.

Table 2. Demographic profile of the respondents

Demographic profile		Number of Respondents (N=64)	Percentage (%)
Gender	**Male**	**64**	**100**
Age	Less than 30 years old	4	6
	Between 30-40 years old	21	33
	Between 40-50 years old	30	47
	More than 50 years old	9	14
Work Experience	Less than 10 years	19	30
	Between 10-20 years	28	44
	More than 20 years	17	26
Professional Qualification	Bachelors	23	36
	Master	36	56
	PhD	5	8

4.2. Descriptive statistics

Table (3) shows the tested variables' descriptive statistics, including some central indicators and dispersion.

Therefore, the minimum distance between the mosque and the company's main office in Tehran is 1.37 km. Also, considering the average value of the financial leverage variable indicates that approximately 60% of the assets of the sample companies are financed by borrowing. Another noteworthy point of this table is that the market value of Return on Equity of most sample companies is higher than its book value, evidenced by the value of the average Growth Opportunities variable (1.680) in the table (3).

As observed in the table above, the mean of the negative skewness of stock return and down-to-up volatility variables are -0.173 and -0.073, respectively, which is higher than the values reported by Cao, Xia, and Chan (2016) and Li, Wang and Wang (2017). This indicates that the sample companies in this study are more prone to stock prices crash. The average religion at a distance of 100 km indicates that the average distance between the nearest mosque and the headquarters of companies is 38.633 km, which shows that the shorter the distance between the sample companies

and mosques, the more religious beliefs of their managers are.

Table 3. Descriptive Statistics for Tested Variables

Variables	Abbreviation	Distance	Mean	Median	Max	Min	S.D.
Negative Skewness of Stock Return	NCSKEW	----	-0.173	-0.286	3.465	-3.295	2.145
Down-to-Up Volatility	DUVOL	----	-0.073	-0.064	0.573	-0.862	0.027
Religion (Religion Manager)	RELIGION	100KM	38.633	40.077	73.493	1.376	10.302
Firm Size	SIZE	----	6.301	6.256	8.138	4.863	0.647
Financial Leverage	LEV	----	0.598	0.602	1.213	0.173	0.212
Growth Opportunities	GWTH	----	1.680	1.443	2.696	0.868	0.630
Return on Equity	ROE	----	0.048	0.090	0.402	-1.010	0.186
Heterogeneity of Investors	DTURN	----	-0.010	0.006	16.146	-14.372	0.461

4.3. Regression assumptions

Before estimating the model, it is necessary to examine the regression model's assumptions, including the normality of the dependent variable, the homogeneity of variance, the lack of multicollinearity between the explanatory variables, and the lack of autocorrelation between the error components of the model. In order to investigate the normality of the dependent variable distribution, the Jark-Bra test is applied. The results of this test are presented in Table (4). Since the significance level of this test for the dependent variable is less than 0.05, the null hypothesis representing that the dependent variable is normal would be rejected. To solve this problem, Johnson transformations are used and the results based on the normality of the dependent variable are presented in Table (5).

Table 4. Results of Jark-Bra Test

Variable	The significance level of the Jark-Bra test	Variable	The significance level of the Jark-Bra test
Negative Skewness of Stock Return	0.000	Masculinity	0.000
Down-to-Up Volatility	0.000	Firm Size	0.000
Uncertainty Avoidance	0.004	Financial Leverage	0.000
Power Distance	0.006	Growth Opportunities	0.000
Individualism	0.001	Heterogeneity of Investors	0.000

Furthermore, the White correction method is used to solve the possible heteroscedasticity problem. In addition, to ensure that there is no multicollinearity problem between the variables, the multicollinearity test is evaluated by using the variance inflation factor (VIF), considering that the values of this statistic for the explanatory variables in Table (6) are less than 10, it can be discovered that the multicollinearity problem is not a threat in the model. F-Limer and Hausman statistics are also used to estimate the type of data and the method used in the final fit, and the results are given in Tables (7) and (8), respectively. Finally, the Durbin-Watson statistic is applied to test the autocorrelation between the error components of the model and the results are presented in Tables (9) and (10).

According to Table (4), the level of significance of the dependent variable (the criteria of stock price crash risk) is less than 5%. Therefore, it does not have a normal distribution. Since one of the

regression assumptions is the normality of the dependent variable distribution, Johnson's transformation in the Minitab Statistical Software is used to convert the distribution of the dependent variable to the normal distribution; the results are shown as follows:

Table 5. Results of Jark-Bra Test after Johnson's Transformation

Variable	Significance Level
Negative Skewness of Stock Return	0.168
Down-to-Up Volatility	0.174

The results of Table (5) show that the significance level of the dependent variable after Johnson transformations is equal to (0.168 and 0.174), which indicates the normalization of the dependent variable.

Table 6. Check the multicollinearity between Variables

Model	Variable	NCSKEW	DUVOL	RELIGION	SIZE	LEV	GWTH	ROE	DTURN
Model 1	VIF	1.41	1.36	1.39	1.35	1.42	1.33	1.65	1.47
	Tolerance	0.709	0.990	0.719	0.741	0.704	0.751	0.97	0.55
Model 2	VIF	1.28	1.97	1.62	1.37	1.66	1.87	1.73	1.63
	Tolerance	0.667	0.497	0.336	0.851	0.775	0.997	0.943	0.589

Limer test:

In order to select one of the panel data methods or Pooled data, the F-Limer statistic is applied. According to the results obtained from the F-Limer test, the null hypothesis is rejected and the alternative hypothesis is confirmed; in other words, the panel data method is more appropriate.

Table 7. Result of F-Limer Test

Test Summary	Research Model	Statistics value	Degrees of freedom	Significance Level	Test Level
Cross-Section F	(1)	8.813	63.339	0.000	0.05
Cross-Section F	(2)	9.673	63.339	0.000	0.05

Hausman Test:

After selecting the panel method by the F-Limer test, the Hausman test is used to select one of two methods consisting of fixed or random effects. The results obtained from Table (8) indicate using the fixed effects versus random effects method in estimating the regression model.

Table 8. Result of Hausman test- Fixed Effects

Result of Test	Probability Value	Degrees freedom	Significance Level	Chi-Square Statistics
Fixed-cross section	0.018	7	0.000	4.683
Fixed-cross section	0.010	7	0.000	5.938

4.4. Hypothesis test results

The result of testing the first hypothesis is shown separately in Table (9).

Table 9. Results of estimating the first model based on two criteria for stock price crash risk

Variables	Negative Skewness of Stock Return		Down-to-Up Volatility	
	Coefficient	T Statistic	Coefficient	T Statistic
C	0.361	0.733	0.673	0.997
Uncertainty avoidance	-0.701**	-10.607	-0.696**	-10.341
Power distance	0.022	1.256	0.035	1.329
Individualism	0.175**	2.983	0.263**	3.015
Masculinity	0.173	1.012	0.186	1.148
SIZE	-0.001*	-3.928	-0.003*	-3.998
LEV	0.673**	9.997	0.396**	4.886
GWTH	0.059	0.302	0.024	0.674
ROE	-0.406**	-5.412	-0.320**	-5.302
DTURN	0.031	1.143	0.248	1.302
Determination Coefficient	0.428		0.494	
F Statistic	10.793		10.158	
P-Value	0.000		0.000	
Durbin-Watson Test	1.948		1.993	

** and * represent statistical significance at the 5% and 1% error levels, respectively.

As shown in Table (9), the coefficient of determination shows that the independent and control variables (0.428, 0.494) explain the changes of the dependent variable, respectively. The probability values of the F statistic (0.000) show that the multivariate regression pattern is significant; Therefore, the null hypothesis indicating the goodness of the fit is accepted, which points to the accuracy of the model determination. The values of the T-statistic for the types of cultural elements, including Power Distance (1.256 and 1.329) and Masculinity (1.012 and 1.148), show that these two cultural elements based on the criterion of Negative Skewness of Stock Return coefficient (NCSKEW) and Down-to-Up Volatility (DUVOL) have no significant effects. Also, according to the results, the elements of Uncertainty Avoidance have a negative and significant effect. Individualism in managers has a significant positive effect on stock price crash risk factors. The results of testing the second hypothesis (estimation of model number 2) separately based on each of two criteria of Negative Skewness of Stock Return coefficient (NCSKEW) and Down-to-Up Volatility (DUVOL) for the stock price crash risk are shown in Table (10):

As shown in Table (10), the value of the F statistic is equal to 0.000 and indicates that both models are significant at a 95% confidence level and have the necessary adequacy. The Adjusted Coefficient of Determination (R2) indicates that approximately 73% of changes in the Negative Skewness of Stock Return coefficient (NCSKEW) and 68% of changes in the variable “Down-to-Up Volatility (DUVOL)” can be explained by the explanatory variables of the model. Also, the values obtained from Durbin-Watson Test indicate the lack of first-order autocorrelation between the error of the two models. Also, the obtained coefficients for the religion variable show the Negative Skewness of Stock Return coefficient (-0.038) and Down-to-Up Volatility (-0.046), which indicates a negative relationship between religion and factors for stock price crash risk. According to the t-statistic, it can be argued that this relationship is significant. This means that according to the distance between the mosques and the companies' main office, the shorter the distance, the higher the level of religiosity of the managers. Finally, due to their beliefs in Islam and fairness, they try to hide bad news from companies. Indeed, the non-concealment of managers leads to negative news not being accumulated in the company and not being released in the stock market suddenly, and ultimately it could reduce the stock price crash risk.

Table 10. Results of estimating the second model based on two criteria for stock price crash risk

Variables	Negative Skewness of Stock Return		Down-to-Up Volatility	
	Coefficient	T Statistic	Coefficient	T Statistic
C	0.039*	3.671	0.041*	3.558
Religion	-0.038*	-3.663	-0.046*	-3.563
SIZE	-0.168**	-3.218	-0.286**	-2.516
LEV	0.053*	2.673	0.048*	2.788
GWTH	0.235	0.741	0.228	0.689
ROE	-0.264**	-3.763	-0.307**	-3.924
DTURN	0.218	0.914	0.211	0.857
F Statistic	12.248**		F Statistic	10.668**
P-Value	0.000		P-Value	0.000
Adjusted Determination Coefficient	0.732		Adjusted Determination Coefficient	0.684
Durbin-Watson Test	2.143		Durbin-Watson Test	2.053

** and * represent statistical significance at the 5% and 1% error levels, respectively.

4.5. Sensitivity analysis

The Impact of Religion on the Stock Price Crash Risk in Environments with Different Corporate Governance: Complementary and Alternative Theory

The debate on whether the impact of internal and external monitoring on managers' behavior based on theory is complementary or alternative is still unclear in this study. From a corporate governance perspective, managerial opportunism will be severe if the quality of corporate governance is low (corporate governance). It is doubtful that religion can restrict managers from hiding bad news in companies with lower corporate governance. From the perspective of foreign corporate governance, since religion is a part of social culture and not legal, the extent to which people agree or disagree with religious teachings depends on their moral discipline. Theoretically, there is a complementary or alternative relationship between religion and corporate governance mechanisms. Based on the theoretical framework, Chen et al. (2013) state that the relationship between religion and corporate governance is consistent with theory, not alternative. The relationship between religion and corporate governance mechanisms regarding stock price crash risk reflects two aspects of corporate governance. This section analyses two aspects of internal and external corporate governance. Table (11) presents the results of the cross-sectional analysis. As it is clear, the results show that religion coefficients are negative and significant in both management groups with internal and external mechanisms of corporate governance in companies. These results show that the relationship between religion and corporate governance (internal and external supervision) in Iran is significant, consistent with Callen and Fang (2015). The obtained results support the complementary theory in line with the research conducted by Chen et al. (2013). Whether religion can be effectively linked to reducing the stock price crash risk depends on the internal sovereignty of companies. In this way, religion can play an effective role in companies with high corporate governance in a strong internal environment. These results mean that religion cannot completely replace domestic corporate governance and a strong legal system. When internal corporate governance and a high-quality legal environment are sufficient, conditions have been created that lead to greater religious influence.

Table 11. Results of Sensitivity Analysis Estimation Based on Two Criteria of Stock Price Crash Risk

Variables	Negative Skewness of Stock Return		Down-to-Up Volatility	
	Coefficient	T Statistic	Coefficient	T Statistic
C	0.024*	3.557	0.029*	3.688
Religion	-0.033*	-3.325	-0.036*	-3.468
CG-Internal	-0.297**	-2.273	-0.306**	-2.318
CG-External	-0.386**	-2.035	-0.392**	-2.098
SIZE	-0.212**	-3.108	-0.224**	-3.614
LEV	0.073*	2.483	0.069*	2.417
GWTH	0.217	0.845	0.227	0.915
ROE	-0.428**	-3.059	-0.412**	-3.083
DTURN	0.584	0.875	0.577	0.996
F Statistic	9.628**	F Statistic	9.443**	
P-Value	0.000	P-Value	0.000	
Adjusted Determination Coefficient	0.612	Adjusted Determination Coefficient	0.598	
Durbin-Watson Test	1.793	Durbin-Watson Test	1.768	
** and * represent statistical significance at the 5% and 1% error levels, respectively.				

Table 12. Results of Sensitivity Analysis Estimation Based on Two Criteria of Stock Price Crash Risk

Variables	Company-Specific Monthly Returns		Maximum Sigma	
	Coefficient	T Statistic	Coefficient	T Statistic
C	0.039*	3.971	0.042*	3.971
Religion	-0.022*	-3.667	-0.031*	-3.667
SIZE	-0.418**	-3.266	-0.387**	-3.266
LEV	0.034*	3.986	0.028*	3.986
GWTH	0.310	0.973	0.264	0.973
ROE	-0.410**	-3.536	-0.382**	-3.536
DTURN	0.612	0.824	0.597	0.824
F Statistic	12.723**	F Statistic	11.589**	
P-Value	0.000	P-Value	0.000	
Adjusted Determination Coefficient	0.512	Adjusted Determination Coefficient	0.467	
Durbin-Watson Test	1.918	Durbin-Watson Test	1.967	
** and * represent statistical significance at the 5% and 1% error levels, respectively.				

The Effect of Religion on Criteria for Stock Price Crash Risk

In this section, following previous research, two other stock price crash risk metrics are used to measure it. In order to measure the stock price crash risk, first use the firm-specific monthly return relationship (Hutton, Marcus and Tehranian, 2009; Bradshaw et al., 2010; Kim, Li and Zhang, 2011; Callen and Fang, 2013). On the other hand, according to Bradshaw et al. (2010), maximum sigma creates a quantitative and continuous measure to calculate the stock price crash risk. Also, maximum sigma is defined as outflow returns based on the standard deviation of a particular company. Therefore, in sensitivity analysis, considering the effect of religion on other stock price crash risk indicators, we will seek the effect of this relationship. The result obtained in Table (12) shows that the more religious the company's managers are, the lower the risk of a stock price crash with the two criteria mentioned previously.

5. Discussion and Conclusion

Providing information about the company's activities is considered one of the managers' most important tasks. Providing this information helps investors evaluate the stewardship or accountability of managers regarding the resources available to them. In this regard, managers are motivated not to publish bad information and bad news to maintain their credibility. This negative information would be accumulated over time in the company, and when it reaches its peak, it suddenly enters the market and leads to a sharp drop or fall in stock prices. Various factors affect the behavior of managers as decision-makers in the organization. Weber believes that if religion and religious characteristics increase people's motivation to work and be profitable, it will be considered important. Belief in religion leads managers to make information better available to others, significantly improving the problem of information asymmetry. Also, according to the findings and theories of researchers such as Grullon, Kanatas and Weston (2009) and Li and Cai (2016), managers whose companies are closer to local mosques have higher religiosity and are less likely to engage in immoral issues per Islam. They always try to run the company in a healthy environment and do not always hide bad news from their shareholders. Therefore, the shorter the distance between the company and the surrounding mosques, the lower the stock price crash risk in those companies compared to other companies at a greater distance. On the other hand, the culture of each country is one of the important factors affecting the value of accounting at the national and international levels, which should be paid much attention to in accounting research. Gray (1988) argues that culture is classified into two dimensions: secrecy and transparency. While more limited information is reported in culturally secret societies to maintain power, a transparent culture emphasises providing transparent information. Dang et al. (2017) claim that both the culture of secrecy (due to the accumulation of negative news) and transparency affect the stock price crash risk of the company.

According to the discussion in this study, the effect of culture and religion on the stock price crash risk has been examined. The results show that only two dimensions of uncertainty avoidance and individualism significantly affect the stock price crash risk among the four dimensions of culture. The results show the negative effect of uncertainty avoidance on the stock price crash risk and the positive effect of individualism on the stock price crash risk. Given the negative impact of uncertainty avoidance, it can be argued that conservative risk-averse managers do not make decisions in uncertain conditions, and because they are less inclined to accumulate bad news, they might reduce the stock price crash risk. On the other hand, the positive effect of individualism on the stock price crash risk shows that individualistic managers who do not consult with others about their decisions and insist on their wrong decisions ignore the negative consequences of harmful investments with excessive trust in their decisions and lead to the accumulation of losses in the company and consequently increasing stock price crash risk. These results are consistent with the theoretical framework as well as the research conducted by Chui et al. (2010), Ferris, Jayaraman and Sabherwal (2013) and Dang et al. (2017). Another result of the study is that the religion and religiosity of the manager have a positive effect on the stock price crash risk. This finding is in line with the existing literature in this field and accordance with Li and Cai's findings (2016). Religious managers are less likely to distort and hide due to the company's institutionalization of religious and moral norms and the possible costs of violating religious and social norms (e.g. loss of credibility, emotional damages and other social anomalies) information and accumulating bad news. As a result, the stock price crash risk is reduced. According to these results, it is suggested to potential investors to pay attention to the organisation's geographical location in choosing investment companies. In addition, shareholders and the board of directors are advised to pay special attention to their personal characteristics when choosing a manager as much as possible to managers who have characteristics such as belief in religious norms

and conservative managers who do not make decisions in uncertainty.

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Appendix

Cultural Attitudes Questionnaire

Phrase	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Completely Disagree
1-Meetings are usually more effective when run by one man.					
2-Men are more important than women in having a career path.					
3- Women do not value promotion and recognition in their work as much as men.					
4- Women value working in a friendly atmosphere more than men.					
5- Men usually solve problems by logical analysis, while women usually solve problems intuitively.					
6- Solving organizational problems usually requires strength and an active approach that typically comes from men.					
7- Who takes the top management position of the organization is a priority with a man, not a woman.					
8- There are some jobs that a man can always do better than a woman.					
9- Women pay more attention to the social aspects of their jobs than to human progress and advancement at work.					
10- One should not pursue one's own goals alone, regardless of the good of the group.					
11- It is important for the manager to encourage loyalty and a sense of duty in the group.					
12-It is more important for a person to work to be accepted by the group than to be accepted by the himself or herself.					
13- Individual rewards are less important than group welfare.					
14- Group success is more important than individual success.					
15- It is important for people to have job descriptions and instructions explained so that people always know what is expected of them.					
16- Managers expect employees to follow orders and procedures carefully.					
17- Rules and regulations are important because they let employees know what the organization expects of them.					
18- Standard operating procedures are useful for employees at work.					
19- Operating instructions are useful when working.					
20- It is often necessary for a supervisor to emphasize her/him power and authority when dealing with employees.					
21- Managers should not scrutinize the opinions of their subordinates.					
22- A manager should avoid socialization her/him employees outside the workplace.					
23- Employees should not oppose the decisions of their managers.					
24- Managers should not delegate important and difficult tasks to employees.					
25- Managers should make most decisions without consulting employees.					