Int. J. Nonlinear Anal. Appl. 15 (2024) 12, 357–368
ISSN: 2008-6822 (electronic)
http://dx.doi.org/10.22075/ijnaa.2023.29734.4244

Financial constraints and stock price crash risk

Reza Abdolahnezhad Khalil Abad[a], Mahmoud Lari Dasht Beyaz[b,*], Mehdi Salehi[b]

[a]Department of Accounting, Qaenat Branch, Islamic Azad University, Qaenat, Iran

[b]Department of Economics and Administrative Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

(Communicated by Farshid Khojasteh)

Abstract

The main objective of the present study is to assess the relationship between financial constraints and stock price crash risk. In other words, this paper seeks to answer "whether financial constraints can lead to the decline of stock price crash risk or not". The study method is descriptive correlation based on published information from listed firms on the Tehran Stock Exchange from 2012 to 2019, with a selected sample that includes 119 firms (952 observations). The method used for hypothesis testing is linear regression using the integrated data. The obtained results from hypothesis testing show a positive and significant relationship between financial constraints and stock price crash risk, which means the more financial constraints in Iranian business firms, the higher the risk of stock price crash. Since this paper is carried out in an emergent financial market, like Iran, that is highly competitive with severe economic sanctions and high inflation, it can provide helpful information in this area for the readers and contribute to the development of science and knowledge.

Keywords: financial constraints, stock price crash risk
2020 MSC: 91B05, 91G45

1 Introduction

One of the most critical concerns faced by investors and shareholders of firms is the stock price crash risk, which can be prevented by knowing its affecting factors. Falling stock prices are a huge and unusual negative change in stock prices that occurs without a significant economic event and is considered a phenomenon synonymous with negative skewness in stock returns [27].

The fall in stock prices is due to its internal information management. According to agency theory, conflict of interest between shareholders and management tends to hide managers' bad news. This, in turn, leads to fraudulent financial reporting by managers. Biased financial reporting helps managers benefit by intervening in the financial decision-making process [43].

Studies (e.g., Jin and Myers [30]; Hutton et al. [27]) attribute the stock price crash risk to management hoarding bad news. In particular, managers have incentives to hide bad news for business reasons and short-term compensation (Jin and Myers [30]; Kothari et al. [37]; Baginski et al. [1]). However, there is a certain range to which it can be very costly or difficult for managers to hide bad news, but they usually cannot predict when it will reach this point

*Corresponding author
Email addresses: abdollahnejad.master@yahoo.com (Reza Abdolahnezhad Khalil Abad), m.lari@um.ac.ir (Mahmoud Lari Dasht Beyaz), mehdi.salehi@um.ac.ir (Mehdi Salehi)

Received: January 2023 *Accepted:* April 2023

[23]. Once this threshold is reached, not all bad news stored can be kept in one place, so some bad news is revealed, which leads to a sudden and dramatic fall in stock prices, i.e., falling stock prices (Chen et al. [9]; Hutton et al. [27]). Accordingly, the risk of falling stock prices indicates the possibility of falling stock prices due to hoarding of bad news that will lead to falling stock prices (e.g. Jin and Myers 2006; Hutton et al. [27]).

On the other hand, if the bad news is released to the market in time and the stock price falls, there will be no incorrect stock pricing and no incentive for conscious insider trading. In other words, the conscious sale of an insider is only possible when the disclosure of bad news is delayed, and as a result, the stock price is over-announced. However, it is difficult to determine empirically whether a particular piece of bad news was hidden before it was published. Thus, in contrast to the various corporate bad news events studied in the previous domestic trading literature, the stock price crash risk provides a powerful public environment in which managerial incentives in opportunistic domestic after-sales are examined. Although managers usually cannot predict exactly where their firm's stock price will actually fall, they may still be able to assess the likelihood of such an event.

The bad news about the firm leads to investors being reluctant to invest in the firm, which increases the cost of financing and ultimately leads to financial constraints. Financial constraints refer to the amount of cash needed to invest in a firm greater than the business unit's available and receivable cash (He et al., 2021). In other words, the business unit cannot provide the required funds through internal or external sources [24]. Measuring financial constraints is very difficult for foreign investors who do not have private information. Even if they do achieve financial constraints, they may not be able to grasp the implications of financial constraints for future stock price crashes. Because of this, people outside the firm can hardly assess the amount of bad news and possibly falling stock prices [6].

In business units, managers' decisions are wary with or without financial restrictions, and stock prices may be affected differently in such firms. According to He and Ren [24], financial constraints reduce the firm's value and expose them to stock price fluctuations. Firms seek financing through loans to escape financial constraints, but financing costs can be high for firms. Therefore, managers hide bad news to show the desirability of the firm's situation. These factors may eventually lead to drastic price changes in stock prices and falling stock prices.

The present study is important in several respects: First, previous research [9] examined the impact of financial information transparency, tax avoidance, and corporate governance on stock price risk, and little research (He and Ren, [24]). Moradi et al., [43]) have examined the impact of financial constraints on stock price risk. Because financial constraints motivate firm executives to hide negative business unit information from shareholders, and concealing bad firm news may eventually cause stock prices to fall, it will be important to examine the effects. Second, capital market analysts, accounting professional associations, and stockbrokers around the world are always looking for answers to the question, what are the causes of financial constraints and the risk of falling stock prices? What are the solutions to prevent these phenomena, and what are the warning signs?

Exploring this issue can be particularly crucial in Iran, which has witnessed severe fluctuations in the stock market during the last years. Further, since tough economic and political sanctions have severely influenced Iran in the previous years, the Tehran Stock Exchange suddenly fell sharply due to the withdrawal of the United States from the JCPOA. Therefore, the present study investigates the effect of financial constraints on the stock price crash risk of firms listed in the Iranian stock market.

2 Theoretical Foundations and Hypotheses Development

2.1 Stock Price Crash risk

Falling stock prices is defined as a phenomenon synonymous with the negative skewness of stock returns: Stock falling is a rare phenomenon in the capital market which occurs when a firm-specific monthly return over some time, 2/3 standard deviation, is lower than the average monthly specific return of the firm during the same period (Hutton, Marcus and Tehranian, [27]). This definition is based on the statistical concept that assuming the normal distribution of the firm's specific monthly return, fluctuations between the average plus 3.2 standard deviations and the average minus 3.2 standard deviations are considered normal fluctuations and fluctuations outside this distance are considered abnormal. Given that the fall in stock prices is an abnormal fluctuation, the number 3.2 is considered the boundary between normal and abnormal fluctuations [27].

Falling stock prices are referred to as a phenomenon in which there is a sudden and negative revision of investors' expectations about a firm's stock, and also complex investors have lower risk and higher expectations which are closer to objective criteria than other investors with a lower level of complexity, [50]. Some results also indicate that investors' behaviour affects stock market trading, so optimism has a negative effect on trading volume, and pessimism has a positive effect [45].

In a recent study, Kim, Wang and Zhang [36] identified two main components of falling stock prices:

The first is the firm's management, which, due to selfish motives for its personal interests or benevolence for the organisation's goals, overestimates the firm's performance by delaying the dissemination of bad news and accelerating the dissemination of good news. It creates a bubble in the firm's stock price.

The second is the firm's accounting system, which allows the manager to perform the above actions. The manager's ability is only positively associated with the risk of falling stock prices when the manager's distrust is high, and when there are weak internal controls, inconsistencies in investor beliefs, and high information asymmetry, the combined effect of manager distrust and manager's ability on the risk of corporate collapse will be more obvious [41].

2.2 Financial Limitations

Financial resources are essential for investment in order for firms to survive. However, many firms in developing countries rank low due to information asymmetries and market representation problems, which have been a barrier to corporate investment and economic growth (Ullah, [51]; Xu et al., [54]). Fazzari et al. [18] put forth the financial constraint hypothesis according to the theory of information asymmetry. Due to information asymmetry, more transaction costs and information costs will be imposed on the firm and in total the firm's financing costs will increase and the firm's external operations will be subject to restrictions and this will cause businesses to rely on domestic cash flow in their investment activities, and when the difference between domestic and foreign financing increases, the financing constraint becomes more apparent [54].

Financial constraints occur when there is a significant difference between the cost of external financing and the opportunity cost of domestic capital (Whited, [52]; Kaplan and Zingales, [31]). As a result, limited firms cannot finance projects with a positive net present value. Financial constraints refer to the difficulty of receiving external funds when firms are faced with better investment opportunities [54]. Factors that can reduce financial constraints have been explored in previous research, such as ownership structure [13], political affiliation [14], product market competition [4] and corporate governance [2].

Several studies have shown that financial constraints have a negative effect on corporate dividend policy (Pathan et al., [44]; Chen and Wang, [11]; DeAngelo, [15]). Recent studies show that firms with financial constraints pay dividends to shareholders, and the number of firms with financial constraints and dividend payments increases over time (Skinner and Soltes, [50]; Jiang and Stark, [29]). This suggests that firms with financial constraints are motivated to reduce future external financing costs by using dividends to build and enhance good reputations (Li and Zhao, [40]; Cheng et al., [12]).

Firms with financial constraints are more likely to issue more stocks when their stocks are overvalued, while firms with no constraints prefer to issue debt [8]. Further, it can be said that older and larger firms face fewer financial constraints [28].

3 Explaining the relationship between financial constraints and stock price crash risk

The main goal of investors is to invest in business units to make a profit and maximize their profits. Therefore, the risk of stock price falls will greatly affect their decisions [9]. Given the importance of falling stock prices, it is important to examine the factors that affect it, such as financial constraints. Financial constraints prevent financing for all desirable investments. Inability to finance the investment may be due to poor credit conditions and inability to obtain a loan or inability to issue new shares. Financial constraints increase the cost of financing. Therefore, managers hide bad news to reduce financing costs (Jin and Myers, [30]; Bleck and Liu, [41]; Hutton et al., [27]; Benmelech et al., [3]; Kim et al., [32]; Kim and Zhang, [35]; Chang et al., [7]; Hong et al., [25]).

The amount of negative information that managers can hide varies from business to business. If there is information asymmetry between the manager and the investor, the cost of not disclosing negative information and accumulating it within the firm will be less than its benefits. Therefore, managers are motivated not to disclose the negative news they have accumulated within the firm [37]. On the other hand, bad news hoarding mechanisms predict that financial constraints positively relate to the stock price crash risk. This section further examines the circumstances under which financial constraints may affect the stock price crash risk. First, managers may prefer not to hide bad news so that stock prices will swell and fall less in the future. Managers' decisions to prevent bad news depending on the trade-off between the benefits of adequate external funding and the costs associated with potential reputational losses and

the threat of litigation. Previous studies have shown that early disclosure of bad news may reduce the likelihood of litigation and the expected costs of litigation (Skinner, [47]; Skinner, [48]; Field et al., [19]; Donelson et al., [17]).

Although legal and credit costs are expected to be high, managers may choose not to hide bad news. However, hoarding of bad news is unlikely to be detected by outsiders who generally do not have access to the firm's private information. Therefore, we assume that managers in financially constrained firms tend to hide bad news because the risk of identifying them will be minimal.

Second, if investors can detect a financial constraint and assess its consequences for hoarding bad news and the possibility of default, financially constrained stocks will be discounted immediately by investors so that stock prices do not rise in a way that is likely to fall significantly. A particular point in such cases is that it is difficult for foreign investors to assess and understand the negative information associated with financial constraints on associated risks and future returns. If investors can understand a financial constraint and assess its relationship to increased risk, they will need to take a higher risk to offset the higher risk they incur. In such a case, we should see a positive correlation between financial constraints and return on equity. However, empirical evidence (e.g., Lamont et al., [38]; Whited and Wu, [53]; Livdan et al., [42]) shows that financially constrained stocks yield significantly higher returns than unrestricted stocks, which suggests that investors may not be able to assess the impact of information related to financial constraints on stock prices (Dichev, [16]; Campbell et al., [6]; George and Hwang, [20]).

On the other hand, the accumulation of negative information in the business unit leads to a fall in stock prices because the concealment of bad news has a range that cannot be maintained and hidden more than that (He and Ren, [24]). According to Jin and Myers [30], managers tend to bear some of the costs of concealing the performance of firms with financial distress so as not to jeopardize their job position and somehow maintain their job position. Although the spread of bad news does not prevent managers from maintaining their position, the sudden arrival of negative information also causes stock prices to fall. The maximum extent to which managers can hide bad news varies from firm to environment in unforeseen circumstances. And it creates the problem for managers that they cannot predict the holding threshold of bad news and prevent stock price crashes (He et al., 2021).

Conflict of interest is a factor that causes managers to accumulate bad news so as not to jeopardize their personal interests (He, 2015)—the more motivation to hide negative news, the more likely that stock prices will fall. Now, suppose the business unit also faces financial constraints to be able to provide the financing it needs. In that case, it will have more incentive to hide negative news in the business unit, so the accumulation of bad news due to financial constraints can Double the probability of a stock price crash [24].

Kim et al. [36] showed that failed R&D projects of financially constrained firms could worsen investors' expectations about such firms' survival risk and competitive position. Some research has shown that funding constraints have a negative effect on research and development investment (Zhang, [55]; Chen and Yang, [10]). Gu [21] and Li [39] showed that for firms with financial constraints, the impact of research and development on firm value is stronger than in firms without constraints. Huang, Xiong and Xiao [26] found a negative relationship between managerial ability and corporate financial constraints and showed that managerial ability to reduce financial constraints by reducing information asymmetry, reducing agency conflicts, and increasing firm profitability. They also stated that the financial constraints of private firms are more severe than those of state-owned and foreign firms and that the effect of management's ability to reduce financial constraints is more pronounced for private firms. Ryan [46] shows that banks with more market power impose more financial restrictions on small and medium-sized firms in European countries.

Regarding the theoretical principles and the studies analyzed, the research hypothesis is as follows:
There is a positive and significant relationship between financial constraints and stock price crash risk.

4 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. Practical studies aim to develop knowledge within a certain field. However, this paper is causal-correlational in terms of data collection and analysis.

5 Research Population

The statistical population of this paper includes all listed firms on Tehran Stock Exchange from 2012 to 2019. The systematic elimination method is used for sampling, and the statistical sample is selected after applying the following

conditions:

1- companies must have been listed on the Tehran Stock Exchange by the end of 2011.

2- companies should constantly be active, and their shares should be transacted during the period of the study (with no more than 6 months of transaction halt)

3- companies must have fully provided the financial information required to conduct this research during the research period.

4- Companies must not be affiliated with investment companies, banks, insurance and financial intermediaries. Regarding the information gathered at the end of 2019, the final sample is obtained and depicted in Table 1.

Table 1: the number of firms in the statistical population by imposing the conditions for selecting the sample

Description	Eliminated firms in total periods	Total No. of firms
Total listed firms on Tehran Stock Exchange		395
Eliminating financial intermediaries, financial supply, insurance, and investment firms	88	
Firms with more than 6 months of transaction halt	24	
Eliminating firms entered the Stock Exchange during the study period	112	
Eliminating due to lack of access to information	52	
Statistical population		119

6 Data Collection Method

The required data for the study are collected based on their types from different resources. The information related to the study's literature and theoretical facts was gathered from library resources, including Persian and Latin books and journals and Internet websites. The information related to firms (balance sheets and profit and loss statements) is used as the research tool. Raw information and data necessary to test the hypotheses were collected from the database of the Tehran Stock Exchange, including Tadbir Pardaz and Rahvard Novin, as well as reports published by the Tehran Stock Exchange Organization through direct reference to them. Other necessary resources will also be collected.

7 Data Analysis

The data analysis method is cross-sectional and year-by-year (panel data). This paper uses the multivariate linear regression model for hypothesis testing. Descriptive and inferential statistical methods are used for analyzing the obtained data. Hence, the frequency distribution table describes data at the inferential level. The F-Limer, Hausman test, normality test, and a multivariate linear regression model are used for hypothesis testing.

8 Research Model

The following model is used for testing the hypothesis:

Research model:

$$rash = a_0 + a_1 F_{C_{it}} + a_2 size_{it} + a_3 Lev_{it} + a_4 ROA_{it} + a_5 RD_{it} + a_6 MB_{it} \tag{8.1}$$

$$+ a_7 age_{it} + a_8 Current_{it} + a_9 Ret_{it} + a_{10} Year_{it} + a_{11} industry_{it} + \epsilon_{it} \tag{8.2}$$

where

9 Research variables:

9.1 Dependent variables: stock price crash risk (Crash):

Stock price crash risk; according to the definition of Hutton et al. [27] and Kim et al. [36], if the stock price has declined severely during the period under study, the stock price will collapse period. Since severe drops in the stock price may occur due to the public decline of prices in the market, the public status of the market should also be considered, and the severe decline of the stock return should be analyzed regarding the market return. So, to calculate the net return of the firm, the following time series regression model should be used:
Model (3)

$$R_{i,t} = \beta_0 + \beta_1 R_{m,t-2} + \beta_2 R_{m,t-1} + \beta_3 R_{m,t} + \beta_4 R_{mt} + 1 + \beta_5 R_{m,t} + 2 + \epsilon_{i,t}$$

In the equation above, R_i is the monthly frim return, R_m is the monthly return of the market, and t is the year months. The residuals of the equation are the net return of the firm in proportion to the market (in fact, the higher the amount of model residuals, the higher the net return would be) to make their distribution close to the normal distribution using the following equation:

$$W_{it} = \ln(1 + \epsilon_{i,t}) \tag{9.1}$$

In this equation, Wit is the net return of the firm. According to the definition, by assuming the normality of net return distribution, the collapse period is when the net return of the firm is 3.09 standard deviations less than the net mean return. According to Kim et al. [32], if a firm experiences the crash period once, it is 1; otherwise, 0 will be assigned.

10 Independent variable:

Financial constraints (F_C): financial constraint indicator of Kaplan and Zingles [31] is calculated as follows:

$$KZ4 = -1.002 * CF + 0.383 * QTobin + 3.139 * LEV - 39.368 * DIV - 1.315 * C$$

where CF: operational cash flow divided by assets; Q Tobin: Tobin's Q index; LEV: debt to assets ratio; DIV: dividend; C: cash inventory to assets ratio.

11 Control variables:

SIZE (firm size): natural logarithm of sample firm assets

LEV (financial leverage): total liabilities to total assets of the firm

ROA (rate of return on assets): net profit to total assets

R& D: costs of research and development are equal to total research and development costs in the year under study

MB: market value to book value of equity, that is equal to market value to book value of equity of the shareholders

AGE (firm age): time lapse between the establishment date and the year under study

CURRENT (current ratio): current properties divided by current debts

RET (firm stock return): firm return rate in the year under study

YEAR: dummy variable of the year

INDUSTRY: dummy variable of industry

12 Data analysis

12.1 Descriptive statistics

This paper uses a model to assess the relationship between political connections and stock price crash risk on the Tehran Stock Exchange listed firms. Besides, the present study has inserted the panel data of 119 Iranian firms from 2012 to 2019 into its database. The variables of political connections, stock price crash risk, and a series of control variables are used to estimate the model. Table 2 displays the information related to the model's variables for firms.

Table 2: Descriptive statistic results

Variable	Obs	Mean	Std. Dev.	Min	Max
crush	952	0.001	0.117	−0.268	0.738
F_C	952	$2.06e^{-10}$	0.303	−0.370	0.942
SIZE	952	9.61	23.13	0.17	194.65
LEV	952	0.57	0.18	0.04	1.27
ROA	952	0.12	0.13	−0.37	0.61
R&D	952	20.11	100.32	0.00	750.00
AGE	952	39.05	13.04	13.00	72.00
Current	952	1.51	0.98	0.21	9.43
RET	952	0.68	1.30	−1.08	9.10
year	952	2016	2.29	2013	2020

13 F-Limer Test Results

To estimate the model, first, we should analyze using the F test whether the data are pooled or panel. The null hypothesis in this test expresses that data are pooled, and hypothesis 1 declares that data are panel. In case after performing the F test, H0 is rejected, the question is based on which models of fixed effects or random effects the model is analyzable, which is determined by the Hausman test. Regarding the results of the pooled test reported in the following table, the null hypothesis concerning the panel data is rejected. Hence, a model with pooled data should be used to estimate the model's coefficients.

Table 3: F-limer test results

Models	F-statistic	Prob	Results
Model1	0.57	0.9999	Pooled

14 Collinearity Test of model (1)

Table 4 shows the results of the collinearity test in model (1).

Table 4: Multicollinearity results

Variables	VIF	1/VIF
Lev	2.12	0.471
Roa	1.78	0.562
Current	1.69	0.591
R&d	1.16	0.861
SIZE	1.15	0.871
F_C	1.09	0.913
Ret	1.08	0.928
age	1.01	0.992
Mean VIF	1.39	

As can be seen in the table, given the obtained VIF statistic that is less than 10 for all variables, there is no collinearity between no model variables. Hence, there is no collinearity problem in the regression.

Table 5: Correlation matrix

	crush	F_C	SIZE	LEV	ROA	R&D	AGE	Current	RET
crush	1.000								
F_C	0.017	1.000							
SIZE	−0.013	−0.012	1.000						
LEV	−0.020	0.000	0.013	1.000					
ROA	0.052	−0.223	0.014	−0.583	1.000				
R&D	0.003	−0.051	0.335	−0.144	0.086	1.000			
AGE	0.005	0.051	0.012	0.018	0.017	−0.031	1.000		
Current	0.008	−0.053	−0.091	−0.625	0.447	0.061	−0.015	1.000	
RET	0.018	−0.004	−0.033	−0.084	0.242	0.025	−0.021	0.071	1.000

15 Correlation matrix of model (1)

The sensitivity analysis test assesses the relationship between used variables in the model two-by-two, the output of which is the above matrix. Since it analyzes the correlation between the variable and itself, the diameter of this matrix is always 1. This means complete correlation, and the more the figures closer to 1, the higher the correlation and the closer the figures to 0, the lower the correlation. The correlation interval is between −1 and +1, where negative figures show inverse correlation and positive figures indicate direct correlation.

16 Results of model estimation

16.1 The following model is used to test the hypothesis of the study:

Research model

$$\begin{aligned} Crash =& a_0 + a_1 F_{C_{it}} + a_2 size_{it} + a_3 Lev_{it} + a_4 ROA_{it} + a_5 RD_{it} \\ &+ a_6 MB_{it} + a_7 age_{it} + a_8 Current_{it} + a_9 Ret_{it} + a_{10} Year_{it} + a_{11} industry_{it} + \epsilon_{it} \end{aligned}$$

17 Results of model (1) specification test

In order to make sure of the functional form of the designed model in chapter three, the Ramsey Reset Specification Test is used after regression. The test's null hypothesis is the absence of omitted variable in the selected model. Given the table results, the F statistic of the Ramsey test is 0.39, which is smaller than the critical value in the table, so the null hypothesis concerning the absence of omitted variable is confirmed in the model.

Table 6: Ramsey Reset Test

Models	F-statistic	Prob
model	10.39	0.7618

Moreover, the heterogeneous variance of the disruptive component is assessed before estimating the model. Regarding the obtained results in Table 7, the obtained chi-square statistic value is 9.31, higher than the chi-square value in the table, and the null hypothesis concerning variance homogeneity is not confirmed. Hence, disruptive components of the research model are not of homogeneous variance. Besides, the serial correlation of disruptive components is also assessed, and there is no serial correlation in the model based on the obtained results in table 8.

As can be seen in table 9, there is a positive and significant relationship between financial constraints and stock price crash risk since, according to the table, the p-value of the variable is 0.024 is smaller than the 0.05 significance level, and its coefficient is the positive figure of 0.014 showing that a positive and significant relationship exists between the variable and stock price crash risk. That means financial constraints in Iranian firms would lead to an increase in stock price crash risk. Since the p-value of the model is 0.04, the model enjoys sufficient significance.

Table 7: Heteroskedasticity test results

Models	F-statistic	Prob
model	9.31	0.0023

Table 8: Autocorrelation results

Models	F-statistic	Prob
model	10.102	0.0019

Table 9: The results of first hypothesis

Variable	Coefficient	Std. Err	statistic	Prob
F_C	0.014	0.006	2.25	0.024
SIZE	−0.0001	0.002	−0.52	0.601
LEV	0.009	0.004	2.26	0.024
ROA	0.068	0.039	1.72	0.086
R&D	0.69	0.030	2.30	0.021
AGE	0.003	0.001	4.64	0.000
Current	−0.002	0.005	−0.39	0.698
RET	0.007	0.001	5.40	0.000
CONS	−0.011	0.026	−0.42	0.672
Wald chi 2 (8)		31.83		
Prob > chi 2		0.0042		

18 Discussion and conclusion

The present study assessed whether or not financial constraints are associated with the stock price crash risk. On the one hand, firms with financial constraints are highly motivated to hide bad news to supply their external financial resources for a long time. The stock price will be incrementally overvalued by concealing bad news, resulting in a higher risk of a stock price crash in the future. On the other hand, firms with financial constraints are exposed to a higher risk of default and are more likely to suffer from stock price crashes. According to such rationales, there are more strong observations concerning the positive correlation between financial constraints and stock price crash risk. According to the results of hypothesis testing expressed in the data analysis section, there is a positive and significant relationship between financial constraints and stock price crash risk, which means firms with financial constraints will face a more severe drop in stock price. Such observations also confirm our causal inference that financial constraints lead to stock price crash risk and show that external investors are less likely to generalize the consequences of financial constraints for stock price crash risk in future. The results of the study are in line with that of He & Ren, [24]; Moradi et al., [43]; Habib et al., [22] who declare that those firms with financial constraints experience a higher risk of the stock price crash since firms with such an issue will lose appropriate opportunities for investment and on the other hand, bear more costs for gaining capital. Under such circumstances, managers attempting to lower capital growth costs embark on manipulating and concealing the firm's status information. As a result, due to hiding negative information, the hidden information bubble will burst and lead to an extreme decline in the firm's stock price. Regarding the obtained findings, we recommend to investors, creditors, and analysts of the capital market to consider the probable indicators of a stock price crash outbreak, including high accruals and financial constraints, like the present study, before investing in firms since the accumulation of information causes a severe loss and stock price crash and bad news, according to the results of the study and that of previous ones (He & Ren, [24]; Moradi et al., [43]; Habib et al., [22]) will cause the effect of financial constraints on stock price crash risk.

References

[1] S.P. Baginski, J.L. Campbell, L.A. Hinson, and D.S. Koo, *Do career concerns affect the delay of bad news disclosure?*, Account. Rev. **93** (2018), no. 2, 61–95.

[2] O. Bayar, F. Huseynov, and S. Sardarli, *Corporate governance, tax avoidance, and financial constraints*, Financ. Manag. **47** (2018), no. 3, 651–677.

[3] E. Benmelech, E. Kandel, and P. Veronesi, *Stock-based compensation and CEO (dis) incentives*, Quart. J. Econ. **125** (2010), no. 4, 1769–1820.

[4] M. Bernini and A. Montagnoli, *Competition and financial constraints: A two-sided story*, J. Int. Money Finance **70** (2017), 88–109.

[5] A. Bleck and X. Liu, *Market transparency and the accounting regime*, J. Account. Res. **45** (2007), no. 2, 229–256.

[6] J.Y. Campbell, J. Hilscher, and J. Szilagyi, *In search of distress risk*, J. Finance **63** (2008), no. 6, 2899–2939.

[7] X. Chang, Y. Chen, and L. Zolotoy, *Stock liquidity and stock price crash risk*, J. Financ. Quant. Anal. **52** (2017), no. 4, 1605–1637.

[8] X. Chang, Y. Chen, and S. Dasgupta, *Macroeconomic conditions, financial constraints, and firms' financing decisions*, J. Bank. Finance **101** (2019), 242–255.

[9] J. Chen, H. Hong, and J.C. Stein, *Forecasting crashes: Trading volume, past returns, and conditional skewness in stock prices*, J. Financ. Econ. **61** (2001), no. 3, 345–381.

[10] P. Chen and M. Yang, *Research on the impact of financing constraints on R&D investment of SMEs*, Commun. Finance Account. **26** (2018), 57–61.

[11] Sh.-S. Chen and Y. Wang, *Financial constraints and share repurchases*, J. Financ. Econ. **105** (2012), no. 2, 311–331.

[12] L.T.W. Cheng, H.-G. Fung, and T.Y. Leung, *Dividend preference of tradable-share and non-tradable-share holders in mainland China*, Account. Finance **49** (2009), no. 2, 291–316.

[13] V.L. Crisóstomo, F.J. López-Iturriaga, and E.V. González, *Nonfinancial companies as large shareholders alleviate financial constraints of Brazilian firm*, Emerg. Markets Rev. **18** (2014), 62–77.

[14] R. Cull, W. Li, B. Sun, and L.C. Xu, *Government connections and financial constraints: Evidence from a large representative sample of Chinese firms*, J. Corporate Finance **32** (2015), 271–294.

[15] H. DeAngelo and L. DeAngelo, *Dividend policy and financial distress: An empirical investigation of troubled NYSE firms*, J. Finance **45** (1990), no. 5, 1415–1431.

[16] I.D. Dichev, *Is the risk of bankruptcy a systematic risk?*, J. Finance **53** (1998), no. 3, 1131–1147.

[17] D.C. Donelson, J.M. McInnis, R.D. Mergenthaler, and Y. Yu, *The timeliness of bad earnings news and litigation risk*, Account. Rev. **87** (2012), no. 6, 1967–1991.

[18] S.M. Fazzari, R.G. Hubbard, B.C. Petersen, A.S. Blinder, and J.M. Poterba, *Financing constraints and corporate investment*, Brook. Papers Econ. Activity **1988** (1988), no. 1, 141–206.

[19] L. Field, M. Lowry, and S. Shu, *Does disclosure deter or trigger litigation?*, J. Account. Econ. **39** (2005), no. 3, 487–507.

[20] Th.J. George and Ch.-Y. Hwang, *A resolution of the distress risk and leverage puzzles in the cross section of stock returns*, J. Financ. Econ. **96** (2010), no. 1, 56–79.

[21] L. Gu, *Product market competition, R&D investment, and stock returns*, J. Financ. Econ.**119** (2016), no. 2, 441–455.

[22] A. Habib, M.M. Hasan, and H. Jiang, *Stock price crash risk: Review of the empirical literature*, Account. Finance **58** (2018), 211–251.

[23] G. He, *The effect of CEO inside debt holdings on financial reporting quality*, Rev. Account. Stud. **20** (2015), 501–536.

[24] G. He and H.M. Ren, *Financial constraints and future stock price crash risk*, J. Corp. Finance **35** (2017), no. 6, 238–295.

[25] H.A. Hong, J.-B. Kim, and M. Welker, *Divergence of cash flow and voting rights, opacity, and stock price crash risk: International evidence*, J. Account. Res. **55** (2017), no. 5, 1167–1212.

[26] Q. Huang, M. Xiong, and M. Xiao, *Does managerial ability affect corporate financial constraints? evidence from China*, Econ. Res.-Ekonomska istraživanja **35** (2022), no. 1, 3731–3753.

[27] A.P. Hutton, A.J. Marcus, and H. Tehranian, *Opaque financial reports, r2, and crash risk*, J. Financ. Econ. **94** (2009), no. 1, 67–86.

[28] A. Ipek Erdogan, *Determinants of perceived bank financing accessibility for SMEs: Evidence from an emerging market*, Econ. Res.-Ekonomska istraživanja **32** (2019), no. 1, 690–716.

[29] W. Jiang and A.W. Stark, *Dividends, research and development expenditures, and the value relevance of book value for UK loss-making firms*, Br. Account. Rev. **45** (2013), no. 2, 112–124.

[30] L. Jin and S.C. Myers, *R2 around the world: New theory and new tests*, J. Financ. Econ. **79** (2006), no. 2, 257–292.

[31] S.N. Kaplan and L. Zingales, *Do investment-cash flow sensitivities provide useful measures of financing constraints?*, Quart. J. Econ. **112** (1997), no. 1, 169–215.

[32] J.-B. Kim, Y. Li, and L. Zhang, *Corporate tax avoidance and stock price crash risk: Firm-level analysis*, J. Financ. Econ. **100** (2011), no. 3, 639–662.

[33] J.-B. Kim, L. Luo, and H. Xie, *Dividend payments and stock price crash risk*, Available in: www. ssrn. com (2016).

[34] J.-B. Kim, Zh. Wang, and L. Zhang, *Ceo overconfidence and stock price crash risk*, Contemp. Account. Res. **33** (2016), no. 4, 1720–1749.

[35] J.-B. Kim and L. Zhang, *Accounting conservatism and stock price crash risk: Firm-level evidence*, Contemp. Account. Res. **33** (2016), no. 1, 412–441.

[36] J.M. Kim, I. Yang, T. Yang, and P. Koveos, *The impact of R&D intensity, financial constraints, and dividend payout policy on firm value*, Finance Res. Lett. **40** (2021), 101802.

[37] S.P. Kothari, S. Shu, and P.D. Wysocki, *Do managers withhold bad news?*, J. Account. Res. **47** (2009), no. 1, 241–276.

[38] O. Lamont, Ch. Polk, and J. Saaá-Requejo, *Financial constraints and stock returns*, Rev. Financ. Stud. **14** (2001), no. 2, 529–554.

[39] D. Li, *Financial constraints, R&D investment, and stock returns*, Rev. Financ. Stud. **24** (2011), no. 9, 2974–3007.

[40] K. Li and X. Zhao, *Asymmetric information and dividend policy*, Financ. Manag. **37** (2008), no. 4, 673–694.

[41] J. Liu and D. Lei, *Managerial ability and stock price crash risk–the role of managerial overconfidence*, Rev. Account. Finance **20** (2021), no. 2, 167–193.

[42] D. Livdan, H. Sapriza, and L. Zhang, *Financially constrained stock returns*, J. Finance **64** (2009), no. 4, 1827–1862.

[43] M. Moradi, A. Appolloni, G. Zimon, H. Tarighi, and M. Kamali, *Macroeconomic factors and stock price crash risk: Do managers withhold bad news in the crisis-ridden Iran market?*, Sustainability **13** (2021), no. 7, 3688.

[44] S. Pathan, R. Faff, C.F. Méndez, and N. Masters, *Financial constraints and dividend policy*, Aust. J. Manag. **41** (2016), no. 3, 484–507.

[45] K. Rashid, Y.B. Tariq, and M.U. Rehman, *Behavioural errors and stock market investment decisions: Recent evidence from Pakistan*, Asian J. Account. Res. **7** (2022), no. 2, 129–145.

[46] R.M. Ryan, C.M. O'Toole, and F. McCann, *Does bank market power affect SME financing constraints?*, J. Bank. Finance **49** (2014), 495–505.

[47] D.J. Skinner, *Why firms voluntarily disclose bad news*, J. Account. Res. **32** (1994), no. 1, 38–60.

[48] D.J. Skinner, *Earnings disclosures and stockholder lawsuits*, J. Account. Econ. **23** (1997), no. 3, 249–282.

[49] D.J. Skinner and E. Soltes, *What do dividends tell us about earnings quality?*, Rev. Account. Stud. **16** (2011), 1–28.

[50] O. Stålnacke, *Individual investors' sophistication and expectations of risk and return*, Rev. Behav. Finance **11** (2019), no. 1, 2–22.

[51] B. Ullah, *Financial constraints, corruption, and SME growth in transition economies*, Quart. Rev. Econ. Finance **75** (2020), 120–132.

[52] T.M. Whited, *Debt, liquidity constraints, and corporate investment: Evidence from panel data*, J. Finance **47** (1992), no. 4, 1425–1460.

[53] T.M. Whited and G. Wu, *Financial constraints risk*, Rev. Financ. Stud. **19** (2006), no. 2, 531–559.

[54] K. Xu, Ch. Geng, X. Wei, and H. Jiang, *Financing development, financing constraint and R&D investment of strategic emerging industries in China*, J. Bus. Econ. Manag. **21** (2020), no. 4, 1010–1034.

[55] S.J. Zhang, *Research on the correlation between financing constraint and enterprise innovation input-from the perspective of combination of industry and finance*, Commun. Finance Account. **15** (2018), 109–113.