

Does Internal Control Reduce Firms' Stock Price Crash Risk? Evidence from China

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ABSTRACT

Under a unique setting in China, the success of internal control is dependent upon whether the informational and disciplinary role it serves effectively manages risks. Using the data from the China Stock Market & Accounting Research database and Dibo databases, the relationship between internal control and stock price crash risk of the firms is investigated. Our empirical results from the regression model show that there is a negative correlation between the price crash risk and the internal control. After two robustness checks, including alternative measures and multi-fixed effects model analysis, the same results are obtained as before. Furthermore, our heterogeneity analysis shows that the effect of internal control is much more significant on small-cap firms and firms with low institutional ownership. Collectively, our findings suggest that the importance of internal control on firm governance helps reduce stock price crash risk.

Keywords: stock price crash risk, internal control, Chinese firms, robustness checks, size of the firms, institutional ownership

1. INTRODUCTION

The stock price crash is a situation that a large number of shares are sold in the stock market for some reason, which causes the price of the shares to fall indefinitely. A stock price crash will cause a lot of harm to the stock market. Thus, how to avoid the stock price crash has been noticed and researched widely by the public and academia. Existing research investigated the impacts of conservatism [1], management guidance [2], and corporate social responsibility [3] on stock price crashes. However, few scholars studied the impact of internal control quality on stock price crash risk. Therefore, this paper gives suggestions for firms about controlling the stock price crash risk by investigating the relationship between the internal control quality and the stock price crash risk.

The internal control system consists of the methods and rules established within the firms to connect and control various business activities. Effective Internal control systems have a positive influence on reducing the agency costs of firms [4-6]. In addition, firms may use powerful internal control systems to promote a

conservative management [7]. As a type of important risk of firms, stock price crash risk may also be affected by internal control quality. Firms with a strong internal control system may reveal frequently high-quality information of profits to reduce the information asymmetry and investors will understand the investment of management more clearly and consider their investment strategies more reasonably and rationally. Moreover, an effective internal control system can promote a strict accounting system that has a positive influence on reducing information asymmetry, all of which have positive influences on avoiding stock price crash risk. So, we expect that there is a negative relationship between the internal control quality and the stock price crash risk.

We focus on China's listed firms for two main reasons. First, China is an ideal place to study the influence of the internal control on the stock price crash risk. On the one hand, contrast to the developed systems in the western developed countries, the stock market of China is characteristic in higher information asymmetry and lower transparency of the information [8]. On the other hand, according to the International Monetary

Fund and the world bank's report, although our financial system is stable, the vulnerability is accumulating in recent years. Moreover, Chinese legislation lacks certain standards on the listed firms, which leads to the chaos management in China [9]. These factors may lead to higher stock price crash risk. Therefore, China's capital markets provide an important sample for the study of stock price crash risk.

Second, the weak institution contexts in China provide an ideal platform for us to explore the effect of internal control. On the one hand, a weak institutional environment scares away potential foreign investors and increases market risk of firms through insufficient regulation [10]. To boost the development of Chinese economy, as encouraged by the government, firms are not responsible for their negative externality created during production. Society encounters the problems of pollution, resource scarcity, and toxic waste, which leads to market inefficiency. On the other hand, considering the negative effect of Confucianism on Chinese society, regulators or managers in firms tend to conceal unfavorable news and show positive information to the shareholders and media [11]. Such cultural background combined with the absence of supervision provides a unique environment to study the influence of internal control on stock price crash risk of the firms.

Particularly, based on a large sample of Chinese firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2007 to 2017, we conclude that the internal control is significant and has a negative association with firms' stock price crash risk. After two robustness checks, including alternative measures and multi-fixed effects model analysis, the conclusion is still valid. Moreover, small size firms and firms with less institutional investors tend to enhance largely their behaviors to manage risks with the same level of internal control. Therefore, we expect internal control to have a negative influence on stock price crash risk to sustain and improve firm performance.

This study contributes to the extant literature for at least two-fold. First, the literature supplements the study related to firms' stock price crash risk and conducts the study from a new perspective, internal control. Some researchers suggest that CEOs who experience early-life disasters are more risk-tolerant and are associated with higher stock price crash risk because they are more willing to bear the risk of hiding bad news [12]. Moreover, other researchers argue that there is a negative relationship between media coverage and stock price crash risk. In addition, media serves as an audit role to reduce that risk when there is reduced monitoring [13]. In our study, we discover that a firm with strong internal control reduces its stock price crash risk and supplements these studies from another perspective.

Second, many studies illustrate that internal control has an influence on various subjects, including the reporting quality [14], the earning persistence [15], the cash holding policies [16], as well as the firms' characteristics (e.g., excellent performance and high liquidity, high leverage and with B shares issuance, sizes and Four-big accounting firms hiring(see [17])). However, little research is done regarding its influence on the firms' stock price crash risk. We expand the literature on the internal control by examining the determinants of a firm's stock price crash risk based on the factor - internal control.

The rest parts of the paper are organized as follows. Section 2 presents a literature review and hypothesis development. Section 3 presents the research design. Section 4 presents the empirical results. Section 5 concludes the paper with discussion and gives suggestions to the governments and the firms.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Stock price crash risk plays an important role in the consideration of investors for investment strategies. The sharp crash of prices in the stock market will disrupt the healthy trading order of the market and may cause social and economic turbulence. Some researchers have noted that reasonable conservatism may limit managers who want to overstate performance to hide the bad news so that firms can avoid stock price crash risk efficiently [1]. Better guidance may also increase transparency and reduce the risk of crashes [2]. Firms that actively participate in corporate social responsibility tend to avoid bad news hoarding behavior, thereby reducing stock price crash risk [3].

Some research has shown that there is a positive relationship between high internal control quality and high-quality internal management guidance [18]. Another research has illustrated that the relationship between internal control quality and conservatism is positive [7]. Moreover, high-quality internal control has a significant promoting effect on corporate social responsibility performance [19]. Therefore, high internal control quality may have a positive influence on avoiding stock price crashes by reducing information asymmetry and promoting internal management guidance. Based on the above analysis, we propose the following hypothesis.

H1. High internal control quality reduces corporate stock price crash risk.

For firms with different sizes, the role of internal control quality in reducing stock price crash risk may be different. Typically, a largely listed firm tends to have a more standard process of controlling the financial statements. It may also receive severe supervision from the supervisor at frequent times. These factors help to

stabilize the financial process. Therefore, firms with a large size have lower stock price crash risk. On the contrary, small firms tend to lack the corresponding standard process and there is also more private information that is inaccessible to the public in the small firms [20]. Therefore, the governance role of internal control may be more pronounced. Moreover, the larger companies tend to have different access to resources. Sufficient capital can also help the larger company to deal with its financial crisis, leading to the universe result that the large company rarely go through the economic crisis even these company lack enough internal control [21]. Large companies will also have to sever systems to avoid overinvestment which will also add the possibility of the stock price crash risk [22]. Thus, we can suppose the following hypothesis.

H2. The restraining effect of internal control quality on corporate stock price crash risk is more pronounced in firms with small size.

The risk of the stock price cash is mainly due to the low transparency of the information [23]. Institutional ownership may reduce the risk of disguising information that is unknown to the investors. The institution also possesses some private information, which helps to make the price react timely to this kind of information and reduce the risk of building up the hidden events. As a result, stock price crash risk in firms with high institutional ownership is lower. While in firms with low institutional ownership, the improvement of internal control is more likely to reduce the stock price crash risk [24]. Based on the above analysis, we propose the following hypothesis.

H3. The restraining effect of internal control quality on corporate stock price crash risk is more pronounced in firms with low institutional ownership.

3. RESEARCH DESIGN

3.1. Sample and Data

We choose our data from the CSMAR and Dibo databases and the sample includes all firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2007 to 2017. In our sample, we exclude financial firms, firms labeled with ST, and firms with missing variables. To minimize the influence of outliers in our data, we winsorize our sample at 1st and 99th percentiles. Our final sample consists of 9982 observations.

3.2. Measurement of Stock Price Crash Risk

Following Hutton [25] (2009) and Kim [26] (2011), we measure firms' stock price crash risk by applying proxies DUVOL and NCSKEW. NCSKEW is measured as a substitutive proxy for DUVOL (see more details in

the section of robustness check). First, we need to calculate the special return on stock *i* in week *t*, which marks as $W_{i,t}$. Following An and Zhang [27] (2013), Jin and Myers [23] (2006), we specify the $W_{i,t}$ in our regression model:

$$R_{i,t} = \alpha_i + \beta_1 R_{m,t-2} + \beta_2 R_{m,t-1} + \beta_3 R_{m,t} + \beta_4 R_{m,t+1} + \beta_5 R_{m,t+2} + \varepsilon_{i,t} \quad (1)$$

where $R_{i,t}$ is the return of stock *i* in week *t*, and $R_{m,t}$ refers to the return on a market-value-weighted index in week *t*. We also add lead and lag terms for the market index return in Eq. (1) to adjust the effect of nonsynchronous trading. The formula of firm-specific return is:

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

Both proxies of stock price crash risk are formulated based on firm-specific return (denoted by $W_{i,t}$). Specifically, we calculate the DUVOL (the down-to-up volatility) and NCSKEW (the negative conditional skewness) for each stock *i* in year *t* as:

$$DUVOL_{i,t} = \log\{[(n_{UP} - 1) \sum_{DOWN} W_{i,t}^2] / [(n_{DOWN} - 1) \sum_{UP} W_{i,t}^2]\} \quad (3)$$

where n_{UP} (n_{DOWN}) refers to the weeks that special return $W_{i,t}$ for stock *I* is greater (less) than annually average rate of return. A higher DUVOL value implies higher crash risk.

$$NCSKEW_{i,t} = -[n(n-1)^{3/2} \sum W_{i,t}^3] / [(n-1)(n-2)(\sum W_{i,t}^2)^{3/2}] \quad (4)$$

where *n* indicates the number of trading weeks in a year for stock *i*. A higher NCSKEW value implies higher crash risk.

3.3. Measurement of Internal Control

Following Yin [28] (2020), we apply $ICI_{i,t}$ (Internal control Index) to measure firms' internal control. We obtain firms' internal control data from the Chinese listed firms' Internal Control Index, shown by Dibo databases. A higher $ICI_{i,t}$ suggests a stronger internal control inside a firm. Prior research mainly focuses on national culture, firms' characteristics, and senior management characteristics, where national culture has a dominant effect [29]. $ICI_{i,t}$ index reflects a company's risk management ability because it plays an important

role in monitoring managers' behavior and reducing agency costs.

3.4. Model specification

To study the influence of internal control on firms' stock price crash risk, we specify the following industry and year fixed effects model:

$$\begin{aligned}
 DUVOL_{i,t+1} = & \beta_0 + \beta_1 IC_{i,t} + \sum_k \gamma_k Control_{k,i,t} \\
 & + \sum Industry + \sum Year \quad (5) \\
 & + \varepsilon_{i,t}
 \end{aligned}$$

where $DUVOL_{i,t+1}$ denoted as the listed firms' stock price crash risk, with high values suggesting higher stock price crash risk. The $IC_{i,t}$ is our key independent variable, and it represents the degree of regulation inside firms to control risks. We expect the coefficient of $IC_{i,t}$

to be negative to show that internal control negatively correlated with stock price crash risk.

Following Garcia-Sanchez [30] (2019), we add six control variables in our regression model, including standard deviation of firm-specific weekly returns ($\Sigma_{i,t}$), detrended average daily turnover ($Dturn_{i,t}$), Natural logarithm of the market value of equity ($Size_{i,t}$), firm financial leverage ($LEV_{i,t}$), return on assets ($ROA_{i,t}$), and absolute accruals ($Absacc_{i,t}$).

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics

Table 1 shows the descriptive statistics of our main variables. We can see that the average of $IC_{i,t}$ is 6.504 and its standard deviation is 0.121. The average of $DUVOL_{t+1}$ is -0.194 and its standard deviation is 0.497.

Table 1. Descriptive Statistics

Variables	N	Mean	Std. dev.	25th	Median	75th
$DUVOL_{t+1}$	9982	-0.194	0.497	-0.516	-0.190	0.115
IC_t	9982	6.504	0.121	6.453	6.522	6.566
$\Sigma_{i,t}$	9982	0.050	0.020	0.036	0.047	0.060
$Dturn_t$	9982	-0.155	0.510	-0.360	-0.086	0.118
$Size_t$	9982	6.560	0.477	6.222	6.531	6.850
LEV_t	9982	0.404	0.199	0.245	0.397	0.551
ROA_t	9982	0.046	0.047	0.015	0.039	0.069
$Absacc_t$	9982	0.005	0.085	-0.041	0.001	0.047

This table reports the descriptive statistics of the main variables. The sample includes 9982 firm-year observations from 2007 to 2017. We estimate the mean, standard deviation, 25th, median, and 75th for each variable.

Besides, we conduct a variance inflation factor (VIF) test to avoid potential multicollinearity among the variables. As the results shown in Table 2, we note that

the mean VIF is 1.208 and all the VIFs of all the explanatory variables are smaller than 10, which means our variables are not affected by multicollinearity.

Table 2. VIF Tests of Key Variables

	VIF	1/VIF
IC_t	1.188	0.842
$\Sigma_{i,t}$	1.139	0.878
$Dturn_t$	1.139	0.878
$Size_t$	1.200	0.833
LEV_t	1.272	0.786
ROA_t	1.464	0.683
$Absacc_t$	1.056	0.947
Mean	VIF	1.208

This table reports the VIF test results. The sample includes 9982 firm-year observations listed on Shanghai Stock Exchange and Shenzhen Stock Exchange from 2007-2017.

4.2. The Effect of Internal Control Quality on Stock Price Crash Risk

As Table 3 shows, the results of our ordinary least squares (OLS) regression results are presented in Column(1), and Column(2) illustrates the results of industry-year fixed effects regression. The coefficients of internal control are -0.146 and -0.142 respectively,

and both are significant at the 1% level. The coefficients of internal control remain significantly negative when $DUVOL_{t+1}$ are used to measure stock crash risk, which supports H1, that high internal control quality reduces corporate stock price crash risk. Besides, in the aspect of control variables, there is a significant and positive relationship between $DUVOL_{t+1}$ and ROA_t in both two regressions.

Table 3. The Influence of Internal Control Quality on Stock Price Crash Risk

Dependent variable=	$DUVOL_{t+1}$	
	(1)	(2)
IC_t	-0.146*** (-3.19)	-0.142*** (-3.05)
Σ_{it}	-1.054*** (-3.92)	0.319 (0.93)
$Dturn_t$	-0.017 (-1.61)	-0.008 (-0.73)
$Size_t$	0.010 (0.81)	0.020 (1.32)
LEV_t	0.053* (1.69)	0.053* (1.67)
ROA_t	0.819*** (5.98)	0.748*** (5.61)
$Absacc_t$	0.106* (1.75)	0.083 (1.40)
Constant	0.686** (2.27)	0.835*** (2.76)
Year	No	Yes
Industry	No	Yes
Observations	9982	9982
Adjusted R ²	0.006	0.060

This table presents the influence of internal control quality on stock price crash risk. Column(1) and Column(2) show the results of the ordinary least squares regression and industry-year fixed effects regression, respectively. The dependent variable $DUVOL_{t+1}$ (the down-to-up volatility) measures stock price crash risk. The other variables are defined in Appendix, and t -statistics are reported in parentheses. The superscripts *, **, and *** indicate significance at the 10 %, 5 %, and 1 % confidence levels, respectively.

4.3. Robustness Checks

4.3.1. Alternative Measures

As we defined in Section 3.2, $NCSKEW_{t+1}$ (the negative conditional skewness) is another variable to measure stock price crash risk. Table 4 presents the results of our ordinary least squares (OLS) regression

and industry-year fixed effects regression are presented on Column(1) and Column(2). The coefficients of internal control are -0.155 and -0.138 respectively, both are significant at the 5% level. The coefficients of internal control remain significantly negative when $NCSKEW_{t+1}$ are used to measure stock crash risk, which indicates that the baseline results are robust.

Table 4. Robustness Checks: Alternative Measures

Dependent variable=	$NCSKEW_{t+1}$	
	(1)	(2)
IC_t	-0.155** (-2.26)	-0.138** (-1.98)
Σ_{it}	-1.056***	0.801

	(-2.63)	(1.55)
$Dturn_t$	-0.030**	-0.020
	(-1.97)	(-1.16)
$Size_t$	0.042**	0.060***
	(2.25)	(2.61)
LEV_t	0.064	0.056
	(1.33)	(1.17)
ROA_t	1.202***	1.079***
	(5.81)	(5.36)
$Absacc_t$	0.118	0.074
	(1.30)	(0.83)
Constant	0.422	0.552
	(0.93)	(1.21)
Year	No	Yes
Industry	No	Yes
Observations	9982	9982
Adjusted R ²	0.005	0.054

This table presents the results of alternative measures. Column(1) and Column(2) show the results of the ordinary least squares regression and industry–year fixed effects regression. The dependent variables $NCSKEW_{i,t+1}$ (the negative conditional skewness) measures stock price crash risk. The other variables are defined in Appendix, and t -statistics are reported in parentheses. The superscripts *, **, and *** indicate significance at the 10 %, 5 %, and 1 % confidence levels, respectively.

4.3.2. Multi-fixed Effects Model Analysis

To relieve the effect of the other unobservable factors that may potentially influence the performance of the stock price crash risk, following Liu [31] {2016}, we conduct the tests by covering the various fixed effects. Columns (1) and (2) describe the results of the

firm fixed effects and the firm fixed effects with the province-year interactions. To sum up, the coefficient of $IC_{i,t}$ is significantly negative in all columns. Therefore, the baseline conclusion is applicable after ruling out the effect of the firm, province specification, and the time-varying factors.

Table 5. Robustness Checks: Multi-fixed Effects Model Analysis

Dependent variable=	$DUVOL_{t+1}$	
	(1)	(2)
IC_t	-0.118**	-0.111**
	(-2.19)	(-2.01)
$Sigma_t$	0.630	0.864**
	(1.54)	(2.05)
$Dturn_t$	-0.007	-0.007
	(-0.48)	(-0.48)
$Size_t$	0.112***	0.115***
	(3.99)	(3.92)
LEV_t	0.027	0.049
	(0.55)	(0.96)
ROA_t	0.588***	0.622***
	(3.46)	(3.57)
$Absacc_t$	0.041	0.028
	(0.61)	(0.42)
Constant	0.034	-0.232
	(0.09)	(-0.58)
Year	Yes	No
Firm	Yes	Yes
Province*Year	No	Yes
Observations	9982	9982
Adjusted R ²	0.062	0.094

Table 5 reports the results of Multi-fixed effects model analysis. Columns (1) and (2) describe the results of the firms and the firm fixed effects with the province-year interactions. The dependent variable $DUVOL_{t+1}$ (the down-to-up volatility) measures stock price crash risk. The other variables are defined in Appendix, and t -statistics are reported in parentheses. The superscripts *, **, and *** indicate significance at the 10 %, 5 %, and 1 % confidence levels, respectively.

4.4. Heterogeneity Analysis

4.4.1. Firm Size

Heterogeneity exists in the original regression. Typically, the stock price of the large firm tends to be less influenced by the quality of the internal control. We choose the group regression to conduct the heterogeneity analysis. To investigate if the effect of the internal control on the stock price crash risk is conditional on firm size, we divide the sample into two subsamples: the firms of the large size and the firms of

the small size. The firms with an average size larger (smaller) than the sample median are included in the large size (small size) subsample. Table 6 reports the results. As shown in this table, the coefficient of the internal control is negative and significant at the 1% level in firms with a small size. However, in firms with a large size, the coefficient of internal control is not significant. The results suggest that the influence of corporate internal control on the stock price crash risk is more pronounced for small-size firms, supporting hypothesis 2.

Table 6. Heterogeneity Analysis: Firm Size

Dependent variable=	$DUVOL_{t+1}$	
	Large size	Small size
IC_t	-0.081 (-1.31)	-0.236*** (-3.24)
Σ_{it}	0.879* (1.83)	-0.473 (-0.93)
$Dturn_t$	-0.016 (-0.84)	-0.007 (-0.47)
$Size_t$	0.005 (0.26)	0.037 (1.02)
LEV_t	0.109*** (2.61)	0.002 (0.05)
ROA_t	1.042*** (6.21)	0.452** (2.10)
$Absacc_t$	0.072 (0.90)	0.099 (1.14)
Constant	0.383 (0.96)	1.461*** (2.80)
Year	Yes	Yes
Industry	Yes	Yes
Observations	5448	4534
Adjusted R ²	0.081	0.046

Table 6 reports the results of the heterogeneity analysis on firm size. The subsamples are classified based on the median of firm size. The dependent variable $DUVOL_{t+1}$ (the down-to-up volatility) measures stock price crash risk. The other variables are defined in Appendix, and t -statistics are reported in parentheses. The superscripts *, **, and *** indicate significance at the 10 %, 5 %, and 1 % confidence levels, respectively.

4.4.2. Institutional Ownership

The firm whose stock is owned by the institution is also less likely to be influenced by the internal control. Therefore, to further investigate if internal control influences corporate stock price crash risk differently in firms with different levels of institutional ownership, we divide the sample into two sets of subsamples: high institutional ownership firms and low institutional ownership. High institutional ownership firms (low

institutional ownership firms) refer to the firms whose proportion of the stock held by the institution is higher (lower) than the sample median. Table 7 reports the results. As shown in this table, the coefficient of the internal control is negative and significant at the 1% level in firms with low institutional relationships. However, in firms with high institutional relationships, the coefficient of internal control is not significant. The results suggest that the influence of corporate internal control on the stock price crash risk is more pronounced

for low institutional ownership firms, supporting hypothesis 2.

Table 7. Heterogeneity Analysis: Institutional Ownership

Dependent variable=	<i>DUVOL_{t+1}</i>	
	High institutional ownership	Low institutional ownership
<i>IC_t</i>	-0.085 (-1.31)	-0.199*** (-2.91)
<i>Sigma_t</i>	0.915* (1.91)	-0.328 (-0.65)
<i>Dturn_t</i>	0.007 (0.37)	-0.015 (-0.99)
<i>Size_t</i>	0.012 (0.60)	0.018 (0.65)
<i>LEV_t</i>	0.041 (0.94)	0.071 (1.51)
<i>ROA_t</i>	0.882*** (4.96)	0.572*** (2.83)
<i>Absacc_t</i>	-0.005 (-0.06)	0.172** (1.96)
Constant	0.400 (0.96)	1.325*** (2.85)
Year	Yes	Yes
Industry	Yes	Yes
Observations	5530	4452
Adjusted R ²	0.061	0.061

Table 7 reports the results of the heterogeneity analysis on institutional ownership. The subsamples are classified based on the median of the institutional ownership. The dependent variable *DUVOL_{t+1}* (the down-to-up volatility) measures stock price crash risk. The other variables are defined in Appendix, and *t*-statistics are reported in parentheses. The superscripts *, **, and *** indicate significance at the 10 %, 5 %, and 1 % confidence levels, respectively.

5. CONCLUSION

To tackle the problem of the hidden information, China's institutional background offers a special approach through which we can evaluate how effective the internal control functions are in a firm. The paper selects 9982 firm-year observations from 2007 to 2017 as a sample. The results show that: (1) internal control is negatively associated with firms' stock price crash risk; (2) after considering other endogenous problems, the above results are still supported; (3) the effect of internal control is prominent on small-scale and low-percent institutional ownership firms through heterogeneity test. In a nutshell, this paper intensifies the understanding of how internal control shapes the firms' stock price crash risk using China's setting.

Our research may enlighten the policy makers and the firms mentioned above. Firstly, our research indicates that the internal control may promote the standardization of the company, thus reducing the stock price crash risk. Therefore, the government and firms should improve the internal control system, so as to promote the internal control to play a better role in

corporate governance. Secondly, the internal control may have less effects on firms, especially those with large size and high institutional ownership. As a result, the government should consider the different situation of the companies when drawing the policy. Since the large company and the company whose stock owned by the institution in a large proportion have a more standardized process of transmitting the information and supervising the firms, excessive policies on the internal control may be a sense of redundancy to these firms which will superinduce the unnecessary process. Therefore, the policy makers should make differentiated policy to different companies.

REFERENCES

- [1] Kim, J.-B. and Zhang, L. (2016). Accounting conservatism and stock price crash risk: firm-level evidence. *Contemp Account Res*, 33: 412-441. <https://doi.org/10.1111/1911-3846.12112>
- [2] NG, Tee Yong Jeffrey; HAMM, S; and LI, E. (2012). "Management earnings guidance and stock price crash risk". *Research Collection School of*

- Accountancy (Open Access). Paper 1008.
http://ink.library.smu.edu.sg/soa_research/1008
- [3] Yongtae Kim, Haidan Li, Siqi Li. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance*. Volume 43. Pages 1-13,ISSN 0378-4266.
<https://doi.org/10.1016/j.jbankfin.2014.02.013>.
- [4] Fama, E. F., & Jensen, M. C. (1983). Agency problems and residual claims. The University of Chicago Press. <https://doi.org/10.1086/467038>
- [5] Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. The University of Chicago Press. <https://doi.org/10.1086/467037>
- [6] Jensen, M.C. (1993), The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, 48: 831-880.
<https://doi.org/10.1111/j.1540-6261.1993.tb04022.x>
- [7] Beng Wee Goh, Dan Li. (2011). Internal controls and conditional conservatism. *The Accounting Review*. 86 (3): 975–1005.
<https://doi.org/10.2308/accr.00000041>
- [8] Cheol S. Eun, Wei Huang. (2007). Asset pricing in China's domestic stock markets: Is there a logic? [J]. *Pacific-Basin Finance Journal*.
- [9] Nianhang Xu et al. (2014). Excess perks and stock price crash risk: Evidence from China[J]. *Journal of Corporate Finance*, 25 : 419-434.
- [10] Omneya Abdelsalam, Antonios Chantziaras, Jonathan A. Batten, Ahmet Faruk Aysan. (2021). Major shareholders' trust and market risk: Substituting weak institutions with trust, *Journal of Corporate Finance*, Volume 66, 101784, ISSN 0929-1199.
<https://doi.org/10.1016/j.jcorpfin.2020.101784>.
- [11] Khalil Jebran, Shihua Chen, Yan Ye, Chengqi Wang. (2019). Confucianism and stock price crash risk: Evidence from China. *The North American Journal of Economics and Finance*. Volume 50, 100995, ISSN 1062-9408.
<https://doi.org/10.1016/j.najef.2019.100995>.
- [12] Yangyang Chen, Qingliang Fan, Xin Yang, Leon Zolotoy. (2021). CEO early-life disaster experience and Stock Price crash risk. *Journal of Corporate Finance*.101928,ISSN 0929-1199.
<https://doi.org/10.1016/j.jcorpfin.2021.101928>.
- [13] Zhe An, Chen Chen, Vic Naiker, Jun Wang. (2020). Does media coverage deter firms from withholding bad news? Evidence from stock price crash risk. *Journal of Corporate Finance*, Volume 64,101664,ISSN 0929-1199.
<https://doi.org/10.1016/j.jcorpfin.2020.101664>.
- [14] Jieqiong Hu, Yin-Che Weng, Fusheng Wang. (2020). The effect of the internal control regulation on reporting quality in China, *Borsa Istanbul Review*,ISSN 2214-8450.
<https://doi.org/10.1016/j.bir.2020.12.006>.
- [15] Yuanyuan GONG, Yongjun YAN, Nianxiang YANG. (2020). Does internal control quality improve earnings persistence? Evidence from China's a-share market, *Finance Research Letters*,101890,ISSN 1544-6123.
<https://doi.org/10.1016/j.frl.2020.101890>.
- [16] Hanwen Chen, Daoguang Yang, Joseph H. Zhang, Haiyan Zhou. (2020). Internal controls, risk management, and cash holdings, *Journal of Corporate Finance*, Volume 64,101695,ISSN 0929-1199.
<https://doi.org/10.1016/j.jcorpfin.2020.101695>.
- [17] Song Xiaowen. (2012). Corporate characteristics and internal control information disclosure-evidence from annual reports in 2009 of listed companies in Shenzhen Stock Exchange. *Physica Procedia*, Volume 25, Pages 630-635,ISSN 1875-3892. <https://doi.org/10.1016/j.phpro.2012.03.136>.
- [18] Mei Feng, Chan Li, Sarah McVay. (2009). Internal control and management guidance, *Journal of Accounting and Economics*, Volume 48, Issues 2–3, Pages 190-209, ISSN 0165-4101, <https://www.sciencedirect.com/science/article/pii/S0165410109000500>
- [19] Li X. (2020). The effectiveness of internal control and innovation performance: An intermediary effect based on corporate social responsibility. *PLoS ONE* 15(6): e0234506.
<https://doi.org/10.1371/journal.pone.0234506>
- [20] Lei Zhang, Chao Wang, Hong Yao. (2021) Information Contagion and Stock Price Crash Risk[J]. *Mathematical Problems in Engineering*.
- [21] Yongtae Kim and Haidan Li and Siqi Li. (2014). Corporate social responsibility and stock price crash risk[J]. *Journal of Banking and Finance*, 43 : 1-13.
- [22] Nianhang Xu, Xiaorong Li, Qingbo Yuan, Kam C. Chan. (2014). Excess perks and stock price crash risk: Evidence from China[J]. *Journal of Corporate Finance*.
- [23] Jin, L., Myers, S.C. (2006). R2 around the world: new theory and new tests. *J. Financ. Econ.* 79, 257–292.

- [24] Heng An and Ting Zhang. (2013). Stock price synchronicity, crash risk, and institutional investors[J]. *Journal of Corporate Finance*, 21 : 1-15.
- [25] Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, r2, and crash risk. *Journal of Financial Economics*, 94(1), 67–86.
- [26] Kim, J. B. , Li, Y. , & Zhang, L. (2011). Corporate tax avoidance and stock price crash risk: firm-level analysis. *Journal of Financial Economics*, 99(3), 639–662.
- [27] An, H., Zhang, T. (2013). Stock price synchronicity, crash risk, and institutional investors. *J. Corp. Financ.* 21, 1–15.
- [28] Yin, M., Zhang, J., & Han, J. (2020). Impact of CEO-board social ties on accounting conservatism: Internal control quality as a mediator. *North American Journal of Economics & Finance*, 101172.
- [29] Huayu Shen, Hao Xiong, Shaofeng Zheng, Fei Hou. (2021). Chief executive officer (CEO)'s rural origin and internal control quality, *Economic Modelling*, Volume 95, Pages 441-452, ISSN 0264-9993. <https://doi.org/10.1016/j.econmod.2020.03.011>.
- [30] Garcia-Sanchez, I.M., Hussain, N., Martinez-Ferrero, J., 2019. An empirical analysis of the complementarities and substitutions between effects of CEO ability and corporate governance on socially responsible performance. *J. Clean. Prod.* 215 (April 1), 1288–1300.
- [31] Liu, X., 2016. Corruption culture and corporate misconduct. *J. financ. econ.* 122 (2), 307–327.