

A literature review of stock price crash risk: evidence from its influencing factors

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Abstract: Since the last century, stock price crash risk has always been a hot issue for researchers, capital market investors, corporate managements, and regulators. Therefore, it's important to investigate what factors may affect stock price crash risk which may be helpful for stakeholders to effectively cope with and prevent the financial risk. In this paper, I investigate the existing literature of the influencing factors of stock price crash risk. Further, I did the distribution analysis of stock price crash risk by year and industry based on China's A-share listed companies from 2011-2020. The result shows that, finance industry was exposed to slightest crash risk, whereas education industry was exposed to the highest. The summary and findings in this study may provide some implications to researchers, regulators, and investors.

Keywords: Stock price crash risk; Review; Influencing factors; Corporate governance.

1. Introduction

Stock price crash refers to the phenomenon that the company's share price plummets in a short time. Professional managers have the motivation to release information selectively for reasons such as wealth, reputation, promotion and career [1-2]. When the concealed negative information continues to accumulate to a certain extent and release intensively, the expectations of investors are suddenly strongly impacted, which will lead to sharp fluctuations and even stock price crash risk. As a banker, I argue that risk management is essential for commercial banks. During the development of commercial banks, there are abundant examples that improper risk management with major customers and low asset quality lead to bankruptcy or government takeover. Under the background that China's capital market has been unstable for a long time since the stock disaster in 2017 and the characteristics of banking industry, how to prevent the stock price crash becomes a significant practical issue, especially for some firms affected most by financial systemic risk (e.g., firms of banking industry). Existing literatures have found that the agency problem arisen from information asymmetry is one of the important reasons for the occurrence of stock price crash risk. Scholars mainly focus on how to prevent the stock price crash risk from the perspectives of lowering agency conflict and increasing information environment. In terms of alleviating the agency conflict of the management, related studies include institutional investor behavior [3], tax management [4], media supervision [5], restriction of insider trading [6], shareholding of major shareholders [7], and so on. For improving information transparency,

existing studies mainly focus on the impact of management self-discipline [8], internal control and information disclosure [7], financial report quality [9-10], accounting conservatism [11], accounting information comparability [12], etc.

In this paper, I aim to review the influencing factors of stock price crash risk, form the perspectives of information disclosure, corporate governance, and external factors. Additionally, I do a descriptive analysis of stock price crash risk in China. I hope this study can provide some implications to regulators, capital market investors, and corporate managers.

The remaining paper is structured as follows. Section 2 reviews the literatures on the relationship between information disclosure and stock price crash risk. Section 3 reviews the literatures on how corporate governance affects stock price crash risk. Section 4 reviews the literatures on the relationship between other external factors and stock price crash risk. Section 5 describes the summary statistics grouping by industry. Section 6 concludes and discusses.

2. Internal factors and stock price crash risk

In this section, I will discuss the main internal factors that may affect corporate stock price crash risk, including accounting information quality, corporate disclosure behaviors, and corporate governance.

First of all, abundant of existing literatures have studied the relationship between accounting information quality and stock price crash risk based on the model of Jin and

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Myers (2006) [13]. First, information transparency (e.g., accounting conservatism, earning management) can be significantly related to stock price crash risk. Hutton et al. (2009) [9] investigated the crash risk among the firm with different transparency and the showed that firms with better transparency had lower stock price crash risk. Kim and Zhang (2016) [14] found that accounting conservatism can reduce crash risk through limiting managers to hoard bad news. Given the widespread utilization of earning manipulation, to maximize their profit, managers are intended to adopt it, leading to severer asymmetry information and lower quality of earning information, and ending up with higher crash risk [15-16]. Besides, De Fond et al. (2015) [17] discovered that the adoption of international financial reporting standards has decreased the non-financial firms' crash risk.

Second, stock price crash risk is also influenced by corporate voluntary disclosure behaviors. The evidence on corporate voluntary disclosure behavior and stock price crash risk are mixed. On the one hand, the management can take the initiative to disclose bad news in order to slow down the adverse reactions of investors. And the active disclosure of enterprise information can also reduce the asymmetry of information to a certain extent, so as to slow down the management's demand for covering up bad news. However, Quan Xiaofeng et al. (2015) [18] found that CEO worsen the information environment by strategically disclosing social responsibility, and finally covered up this behavior through inefficient investment, thus increasing the stock price crash risk.

Third, corporate internal governance mechanism is also significantly correlated with firm-specific information disclosure and hence with stock price crash risk. Kim et al. (2011) [19] considered that complex tax avoidance could mislead the investors into being confused about the company's real financial condition, leading to greater crash risk. Wang et al. (2015) [20] argued that when the shareholding ratio of major shareholder increases, these shareholders would attach more importance to the degree of disclosure for the sake of their self-interest and this may lead to the stock price crash risk. Additionally, if the shareholders begin selling stocks wholesale, stock price crash risk will also increase [6].

3. External factors and stock price crash risk

In this section, I will further investigate the external factors that can influence stock price crash risk.

First, existing research shows that the supervision of institutional investors in effective in restricting the opportunistic management ability of the management, and then affects the level and quality of earnings management. In general, the shareholding of institutional investors is negatively correlated with the stock price crash risk [21]. Second, as an intermediary of information dissemination in the capital market, analysts can also reduce information asymmetry and improve information transparency. Li and Yi (2017) [22] took the companies that male star analysts

and female star analysts pay common attention to as samples, and found that female analysts' prediction of crash risk is more accurate. Compared with analyst coverage, private information access is a more accurate agent. The degree of analyst access to private information and its impact on crash risk is a research direction in the future. The information obtained by analysts mainly comes from the company's financial reports. These reports are mainly the responsibility of auditors. Robin and Zhang (2015) found that the specialized role of information intermediary and corporate governance in the auditor industry reduced the stock price crash risk.

Moreover, auditing is also an important mechanism in lowering stock price crash risk. It is mainly because corporate earnings management can be constrained by auditors, thus reducing the stock price crash risk [23].

Additionally, some other external informal factors are also related to stock price crash risk, such as political connection and culture. Lee and Wang (2017) [24] used Chinese data to study that the existence of political connections among company executives will exacerbate the stock price crash risk. In contrast, the appointment of directors associated with the central government will help private enterprises reduce the stock price crash risk. Using Chinese data, Zeng and Wei (2017) [8] found that the religious atmosphere can reduce the stock price crash risk by affecting the management investment behavior. In the future, the influencing of informal system can be studied from the transnational perspective.

4. Descriptive analysis of stock price crash risk in China

4.1 Variable Measurements

There are four different measures of firm-specific crash risk in the extant literature: binary crash risk measurement (CRASH), negative skewness (NSKEW), down-to-up volatility measure (DUVOL) and crash risk frequency (COUNT).

The binary crash risk measure is a dummy variable, coded one if a firm's weekly returns fall at least 3.09 standard deviations below its mean value each year, and zero otherwise. When it is lower than 3.09, the possibility of stock price crash is high [9]. For continuous variables NSKEW and DUVOL, are calculated for each firm j in year τ , are be calculated as:

$$\text{NSKEW}_{j,\tau} = -[n(n-1)^{\frac{3}{2}} \sum w_{j,\tau}^3] / [(n-1)(n-2) \left(\sum w_{j,\tau}^2 \right)^{\frac{3}{2}}] \# \quad (1),$$

where, n are the trading days in six months for firm j ; R indicates the daily returns for firm j .

$$\text{DUVOL}_{j,\tau} = \ln \{ (n_u - 1) \sum_{\text{Down}} w_{j,\tau}^2 / (n_d - 1) \sum_{\text{Up}} w_{j,\tau}^2 \} \# \quad (2),$$

where, n_u indicates the days that daily return is higher than average in period t for firm j ; n_j is inversely to n_u ; other variable definitions are the same as equation (1).

Lastly, COUNT shows the number of residual returns that are more than k standard deviations above and below the mean, with k chosen to generate frequencies of different confidence level in the lognormal distribution (Jin & Myers, 2006). It equals to the difference between the upside frequencies and the downside frequencies. Higher value of COUNT means a greater stock price crash risk.

4.2 The summary statistics of stock price crash risk

Table 1 reports the summary statistics of Chinese listed companies grouping by industry. As can be seen from Table 1, the stock price crash risk of financial industry firms (mostly commercial banks) in China is lower than that of other industries, which shows that commercial banks have played a crucial role in the stability of the capital market. Therefore, commercial banks should give full play to their role of "maintaining stability" in China's stock market and protecting the interests of market investors.

Table 1. Summary statistics grouping by industry

Industry Name	Fr eq .	NC SK EW	D U V OL	CR AS H
Agricultural industry	68 8	- 0.1 936	- 0.1 29 5	0.1 27 9
Mining industry	87 5	- 0.3 320	- 0.2 33 7	0.0 94 9
Manufacturing	24 3 22	- 0.2 696	- 0.1 85 1	0.1 15 7
Electricity, heat, gas and water supply business	1, 39 4	- 0.2 868	- 0.2 07 5	0.1 16 9
Construction industry	94 7	- 0.3 145	- 0.2 02 7	0.1 10 9
Wholesale and retail industry	2, 34 6	- 0.2 092	- 0.1 39 2	0.1 40 7
Transportation, storage and mail industry	1, 35 6	- 0.3 456	- 0.2 21 0	0.1 12 1
hotel and catering sectors	17 0	- 0.2 345	- 0.1 57 2	0.1 05 9

information transmission, software and information technology services	2, 04 0	- 0.2 916	- 0.1 95 3	0.1 08 8
Financial industry	71 3	- 0.4 230	- 0.2 93 9	0.0 89 8
Real estate	1, 89 9	- 0.3 039	- 0.2 00 3	0.1 12 2
Tenancy and Commercial	45 0	- 0.1 598	- 0.1 15 5	0.1 26 7
Scientific research and technology	22 9	- 0.2 885	- 0.1 61 3	0.1 35 4
Water conservancy, environment and public facilities management	38 6	- 0.2 765	- 0.1 94 0	0.1 21 8
residential service, maintenance and other service sector	72	- 0.3 077	- 0.2 02 4	0.1 11 1
Education	13	0.3 070	0.0 44 3	0.3 07 7
Health and social work	54	- 0.2 168	- 0.1 24 5	0.1 11 1
culture, sports and entertainment	36 2	- 0.1 698	- 0.1 10 4	0.1 46 4
Comprehensive industry	93 8	- 0.2 063	- 0.1 34 9	0.1 14 1
Total	39 2 54			

Table 2 reports the summary statistics of Chinese listed companies grouping by year, ranging from 2011 to 2020. Overall, the changing tendency of the three measurements are similar, but with minor difference. Seeing from CRASH, which is the actual occurrence of ex post stock price crash, the value reaches peak in year 2011-2013, and 2019. These may contribute to the post period of 2008 financial crisis, and the macroeconomic uncertainty in these two years.

Table 2. Stock price crash risk from year 2011-2020

Year	Freq.	NCKEW	DUVOL	CRASH
201	1,80	-	-	0.114380
1	1	0.1876059	0.1366694	9
201	2,11	-	-	0.105710
2	9	0.2380549	0.1773221	2
201	2,36	-	-	0.132091
3	2	0.3145198	0.2064686	4
201	2,44	-	-	0.074149
4	1	0.4777332	-0.312064	9
201	2,45	-	-	0.077673
5	9	0.4324898	0.2932484	9
201	2,52	-	-	0.093032
6	6	0.2773418	0.2107086	5
201	2,67	-	-	0.083426
7	3	0.4581859	0.3151434	9
201	3,06	-	-	0.139459
8	9	0.2204765	0.1046716	1
201	3,41	-0.151923	-	0.164716
9	8	-	0.1111222	2
202	3,60	-0.416576	-	0.137902
0	4	-	0.2612993	3

5. Conclusion and discussion

5.1 Conclusion

This paper summarizes the related literatures about stock price crash risk, including the basic theory, existing measurements, and external or internal determinants. Then, I report the summary statistics of stock price crash risk, based on its distribution by year and industry.

As an important part of the development of China's real economy and virtual economy, commercial banks can not only provide corresponding financial support for the development of the real economy, but also play a key role in the stability of China's capital market. I prove that the stock price crash risk of financial industry firms (mostly commercial banks) in China is lower than that of other industries. Therefore, further research on the stock price stability of listed commercial banks has important theoretical and practical significance.

5.2 The summary statistics of stock price crash risk

Based on the discussion of stock price crash risk, I, as a banker, would like to come up with some suggestions to the financial industry. First of all, it's important to improve the institutional environment, which includes the legal and regulatory system, the protection of market investors. These are the fundamental and long-term measures to prevent and control regional financial risks and ensure the economic "steady response and steady development". The improvement of regional legal system can not only increase the legal cost of the opportunistic behavior of corporate executives, but also reduce all kinds of illegal behaviors and the tunneling of major shareholders. Therefore, it's helpful to improve the quality of accounting information, and alleviate information asymmetry, thus lowers stock price crash risk.

Second, it's necessary for China to continue the market-oriented reform, deepen the reform of the financial system and push forward structural reforms in banking, enhance the overall competitiveness of commercial banks, which could better prevent and control financial risks and safeguard the healthy and orderly development of capital market. Relevant policy departments should continue to strengthen the reform and innovation of banking industry, encourage more small and medium-sized commercial banks to set up branches, and provide policy support and preferential treatment in various aspects such as access to other places and business management.

Third, I suggest commercial banks to constantly optimize their credit resource allocation to major customers, in order to effectively manage and control business risks. The action related to lowering stock price crash risk is to implement the financial product information disclosure system by commercial banks. Improving the transparency of financial products can not only help regulators understand the real operation of commercial banks, but also help investors identify project risks. In addition, I believe that commercial banks should also establish a separate management, account establishment and accounting system for financial products, so as to completely achieve the transparency of financial products and realize the prevention of stock price crash risk.

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