

Ownership Structure and stock price crash risk: Evidence from Karachi Stock Exchange

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Abstract

Stock price crash risk is one of the most significant risks associated with the firm. Therefore, it is important to consider the factors which may influence the price crash risk. Various factors of corporate governance found to have an impact on the stock price crash risk. The ownership structure of the firm is a critical attribute of corporate governance. This study's objective is to determine the impact of two types of ownership of a company (managerial ownership and institutional ownership) on its stock price crash risk. To examine whether a firm's ownership structures have an association with stock price crash risk, the multiple linear regression model applied on the panel data of 190 companies listed on KSE for the year 2009-2018. The results of this study show that there is a significantly positive relationship between the institutional ownership and stock price crash risk. However, no association found between managerial ownership and price crash risk. These results imply that the percentage of institutional ownership should be reduced in the firm's ownership structure to reduce the firm's stock price crash risk.

Keywords: Ownership structure, stock price, crash risk, Karachi stock exchange.

Stock price crash risk is one of the leading and most important factors to consider by the investors and various regulators of the world, including the stakeholders and regulators of a developing country like Pakistan. The importance of stock price crash risk and the factors associated with a company's crash risk is continually increasing day by day, as the regulators of the stock market are much concerned about controlling the stock price crash risk of the market.

On the other hand, investors, being the major stakeholders of a company, are very concerned about the price crash risk of the shares of a company and the determinants that might be responsible for that price crash risk. Stock price crash risk has gained a lot of academic consideration as well. It is important to learn about stock price crash risk and its determinants for the business students. They will become future managers and businessmen striving to control price crash risk in the stock market and improve the profitability and stock price of their firms.

After the financial crisis of 2008, more intense research has begun on this issue. However, most of the research on stock price crash risk has done in the United States and China, which developed countries. Various researchers have completed their research on the stock price crash risk by investigating corporate governance and its multiple attributes such as financial reporting quality (Francis, Hasan, & Li, 2016; Kim & Zhang, 2016), informal institutions; such as religion (Callen & Fang, 2015), audit quality, board structure (Yeung & Lento, 2018), management style and management compensation (Kim, Wang, & Zhang, 2016), etc.

Although a lot of research has been done on this topic before, we cannot find research on this important issue in a developing country, like Pakistan. Being a developing country, Pakistan has

its market volatility and a unique set of regulations for its stock market. It is important to consider the factors of stock price crash risk in a developing country such as Pakistan, while paying attention to the attributes of the concerned market and various other elements of the firms itself that can lead to stock market crashes.

Highlighting the importance of stock price crash risk and various corporate governance attributes, which are related to the price crash risk of the stock market, our study focuses on a critical attribute of corporate governance, which may affect the stock price crash risk. The objective of this study is to determine the impact of the ownership structure of a company on its stock price crash risk. As ownership structure is one of the most important corporate governance attributes, it considered that the firm's ownership structure influences its corporate governance. This can result in lower information asymmetry between the company's management and shareholders as better as the company's corporate governance is and reduce the information asymmetry in that company (Andreou et al., 2016; Ashbaugh-Skaife, Collins, & LaFond, 2006). It is quite understandable that good corporate governance and lower information asymmetry among the board of directors and shareholders will result in a lower likelihood of stock price crash risk in the future.

Although, research in developed countries has already done on various attributes of corporate governance that influence the stock price crash risk. A crucial research gap for developing countries that need to fill as the regulations, market volatility, and various other factors of a developing country are quite different from those of well-developed countries. Therefore, there is a need to research the impact of ownership structure on a developing country's stock

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price crash risk. This study aims to fill this important gap by identifying the relationship between ownership structure and stock price crash risk. This study further investigates the type of ownership structure, which is more beneficial in lowering the stock price crash risk as there are two variables of ownership structure used in this study; managerial ownership and institutional ownership.

This study contributes to the literature in the several ways. First, there has been no research done on this topic before using the data of a developing country, Pakistan. However, we have research studies on this topic for the developed countries like China and the USA. This research is the first research, to the best of my knowledge, using ownership structure as a corporate governance attribute to test its impact on the stock price crash risk.

Secondly, this research contributes to the investors, managers, and regulators of Pakistan in their decision making regarding controlling the stock price crash risk within the Pakistan stock market. Existing investors can use the results of this study while deciding on the company's ownership structure, thus preventing the future crash risk of the stock market.

This study will also benefit investors who are keen to invest in companies that have better future aspects of the organization's profitability and higher stock prices. Investors can use the results of this study to determine the firm's ownership structure and compare it with future stock price crash risk of the company they want to invest. Managers will use the results of this study to make better decisions regarding the company's ownership structure.

Researchers can use this study to conduct further research on this area of corporate governance and crash risk using new variables in their study. Similarly, regulators may also use the results of this study to make better decisions and regulations for Pakistan's stock market. Other developing countries can also use the results of this study in their decision making, as the market volatility and regulations of developing countries like Pakistan can be assumed quite relative to each other.

The rest of the article organized as follows: Section 2 discusses the literature review of this study and hypothesis development from the literature review. Section 3 discusses the research methodology of this study, including the sample data and test results of variables used in this study. Section 4 finally includes a brief conclusion to the research, including the implications for future research and limitations of this study.

Literature Review

Hutton et al. (2009) narrate the stock price crash as a significant negative moment in the firm's adjusted stock returns. These types of movements also tend to enhance the risk profile of business portfolios. After the existence of corporate scandals in the early 2000s, in many high-profile companies, crash risk of stock prices became an important and crucial topic for the regulators and investors of worldwide. Similarly, the financial crisis of 2008 also highlighted the importance of crash risk and increased the need for future research to determine the reasons for stock price crash risk.

Existing research on stock price crash risk highlights that firms with high agency risk are more prone to stock price crashes (Callen & Fang, 2015; Kim & Zhang, 2016). Such companies can increase

information asymmetry between shareholders and managers by concealing or withholding the bad news to manage the earnings and profitability of the firm (Kothari, Shu, & Wysocki, 2009).

Due to this withholding of bad news and manipulation, the profitability of the firm managed temporarily. Still, ultimately at some point, bad news withholding will become significant enough and couldn't be concealed anymore. At that time, the market filled up with bad news withheld before and negative information, which will ultimately result in a stock price crash (Bleck & Liu, 2007; Callen & Fang, 2013; Kim & Zhang, 2016).

Various studies have provided us information regarding the existence of relationship between corporate governance and stock price crash risk (Andreou et al., 2016), management style and stock price crash risk (Kim et al., 2016), financial reporting quality and stock price crash risk (Kim & Zhang, 2016) and internal control environment and stock price crash risk (Chen et al., 2017). All of these topics are relevant to the agency cost. These are some important attributes of corporate governance that have studied with stock price crash risk. In this research, another important attribute of corporate governance is the ownership structure evaluated to see if there exists a relationship between ownership structure and stock price crash risk so that the investors and regulators may use this information to safeguard the market from crashes.

There is no doubt that a strong ownership structure which is well functioning, can monitor the behavior of management well. The agency issue, which is said to relate to the stock price crash risk, can be resolved if there is a strong and effective ownership structure in the firm. We can assume that an effective ownership structure monitors management's behavior; thus, reducing the agency issue and withholding bad news and information asymmetry between management and shareholders will ultimately lead to lower stock price crash risk.

The firm's ownership structure should be able to enhance the ability of shareholders to monitor the management well. It should also improve the effective decision-making power of shareholders and help reduce the information asymmetry between management and shareholders (Ashbaugh-Skaife et al., 2006; Andreou et al., 2016). In this way, the agency issue resolved, and the stock price crash risk will also tend to reduce. The earlier research on stock price crash risk and its determinants, the following hypothesis is drawn to be tested in this study:

H1: Managerial ownership of the firm is positively associated with the stock price crash risk.

H2: Institutional ownership of the firm is positively associated with the stock price crash risk.

Research Methodology

Sample data

The sample data used in this research includes 190 companies listed on the Karachi Stock Exchange (KSE). This research is quantitative. Therefore, secondary sources of data are used to obtain the data of this study. In this study, panel data used to run the regression analysis, using different companies of various sectors in different periods. The data for the last ten years (2009-2018) used to run a regression and determine the effect of

ownership structure on the stock price crash risk. Data has collected from the website of Karachi Stock Exchange (KSE), and the annual reports of the sample companies used in this study and the significance level of all data are kept 0.5% in this study.

Variables measurement and research design

Two variables of ownership structure used in this study. Managerial ownership and institutional ownership are both used as the independent variables used to measure the percentage of managerial ownership and the percentage of institutional ownership in the ownership structure of the firm. These percentages can find from the annual report of each firm. The dependent variable is the NCSKEW “negative coefficient of skewness,” which used to measure the stock price crash risk. Besides these independent and dependent variables, a few control variables are also used in this study to find the impact of other related factors on the dependent variable such as Firm age, taken as the total number of years since the issuance of first IPO of the firm; Leverage, considered as the total liabilities of the firm divided by its total assets and Firm size, taken as the natural log of the market value of the equity of the company, etc.

To measure, the stock price crash risk, NCSKEW proxy is used in this study. Initially, the negative coefficient of skewness NCSKEW was measured by estimating the firm-specific weekly returns indicated by “W” taken as the natural logarithm of one plus the residual from the expanded market model for each firm and year, given in the following regression model:

$$r_{i,t} = \alpha_i + \beta_1 r_{m,t-1} + \beta_2 r_{m,t} + \beta_3 r_{m,t+1} + \epsilon_{i,t}, \quad (1)$$

The $R_{i,t}$ indicates the return of stock in a week t while RM_{t-1} , RM_t , and RM_{t+1} are the value-weighted market return on day $t-1$, day t , and $t+1$, respectively. The firm specific weekly return for a firm in a week is given by:

$$W_{i,t} = \ln(1 + \epsilon_{i,t}) \quad (2)$$

In this equation $\epsilon_{i,t}$ is the residual value of the regression equation (1). The NCSKEW is the negative coefficient of skewness, which is calculated by taking the negative of the third moment of firm-specific weekly returns for each sample year and dividing its standard deviation of firm-specific weekly return raised to the third power. The higher value of NCSKEW depicts that a stock is more prone to crash or more likely to crash while the lower value of NCSKEW denotes less likelihood of stock price crash risk. In the following equation, n is the number of observations.

$$NCSKEW = -((n(n-1)/3) \sum R_{i,t}^3) / ((n-1)(n-2) (\sum R_{i,t}^2)^{3/2}), \quad (3)$$

Table 1: Summary of Descriptive Statistics

Variable	Mean	S.D	Min	Max
Srno	950.5	548.6271	1	1900
fid	95.5	54.86196	1	190
Year	2013.5	2.873	2009	2018
sid	8.3	5.5691	1	21
NCSKEW	-155388	2.0412	-7.29641	53.5797
DUVOL	-6.702	1.3	-14.1537	-0.0042
Mean	-0.015	-1241	-4.08412	-0.86482
SD	-0.061	-571	-0.0316	1.140615
FirmAge	34.86	16.15	1	95
manown	20.23	26.454	0	97.71
conown	-5969657	-2971994	-0.0166	9.236
ROA	-0.0702	-5076548	-1.96	20.763
lev	-0.613	-4334603	0.0008	8.844
mbr	1.938	14.19666	-318.939	142.847
size	15.236	1.662	8.279043	19.94925

Table 1 represents the descriptive statistics of the variables used in this study. Descriptive statistics provided in this table. The total number of observations in this study is 1900 as the data of 190 companies for ten years used to run the regression analysis. The minimum value of the negative coefficient of skewness calculated from the sample is -7.296, while the maximum value is 53.58, which means that the range diversified in the sample data.

However, the average NCSKEW obtained from this sample data calculated using equation (3) is 0.15538. The standard deviation of NCSKEW in the sample is around 2.0412, which is quite acceptable. This table also represents the descriptives of another proxy used for the stock price crash risk, DUVOL (down up volatility). Nevertheless, the main proxy of crash risk is a negative coefficient of skewness; therefore, this study has used NCSKEW as the only dependent variable in regression analysis. The mean of our independent variables is 20.23045 for managerial ownership and 0.5969 for institutional ownership with a standard deviation of 26.45 and 0.297.

The control variables selected for this study initially included leverage, return on assets, market-to-book ratio, firm size, and firm age. However, in the regression analysis, only leverage, firm size, and firm age were taken as control variables. These factors found to control the impact of independent variables on the dependent variable. The mean of leverage found to be 0.613, with a standard deviation of 0.433. Similarly, the mean and standard deviation of firm size is 15.23 and 1.66, respectively. The firm age has a mean of 34.89 and a standard deviation of 16.15 from its mean.

Table 2: Panel Regression using NCSKEW as dependent variable for stock price crash risk

NCSKEW	Coef.	Std.Err	z	p> z	[95% Conf. Interval]	
Mean	3.88	0.37	10.52	0.00	3.16	4.60
SD	24.19	0.84	28.86	0.00	22.54	25.83
manown	0.00	0.00	0.15	0.88	0.00	0.00
conown	0.26	0.13	2.00	0.05	0.01	0.52
FirmAge	0.00	0.00	1.80	0.72	0.00	0.01
lev	-0.37	0.09	-3.97	0.00	-0.55	-0.19
size	0.07	0.02	3.08	0.00	0.03	0.12
_cons	-2.51	0.41	-6.11	0.00	-0.31	-1.70
Sigma_u	0	(omitted)				
Sigma_e	1.69	0.03			1.63	1.74
rho	0	(omitted)				

Likehood_ratio test of sigma_u=0: chibar2 (01) = 0.00 Prob>=chibar2 = 1.000

Table 2 represents the regression analysis run on the sample data using NCSKEW, a negative coefficient of skewness as the dependent variable for calculating the stock price crash risk. The independent variables whose impact on the dependent variable calculated include managerial ownership and institutional ownership along with the other control variables; leverage, firm size, and firm age. The results of the regression are consistent with the H2 hypothesis. The confidence interval in this study kept at 95% with a 5% or 0.05 significance level. The probability value of institutional ownership is 0.045, which is less than 0.05; it means that the institutional ownership is significantly related to the stock price crash risk. The coefficient of determination for the institutional ownership is 0.261, which means the relationship of the dependent and independent variables is positive. The current

study infers that an increase in the firm's institutional ownership leads to a rise in the firm's stock price crash risk. However, the managerial ownership has not been found significant according to the results of regression analysis, thus rejecting the first hypothesis H1. The probability value of managerial ownership is 0.822, which is far higher than 0.05, so we can say that this variable is not significantly associated with the stock price crash risk. The control variables found to be significant in the regression analysis, the leverage, and firm size are significantly related to the stock price crash risk with a probability value of 0.000 and 0.002, respectively. On the other hand, the firm age is not significant as the p-value is in the case of firm age is 0.072, which is higher than 0.05. The coefficient of leverage shows a negative relationship between leverage of the firm and its stock price crash risk. Increasing the leverage of a firm leads to a decrease in price crash risk. However, the firm size is positively associated with stock price crash risk.

Conclusion

The stock price crash risk is a significant risk associated with the firm, and the managers and investors are much concerned to reduce this risk by identifying the factors that impact the price crash risk. This study's results contribute to the managers and other stakeholders of a firm in reducing stock price crash risk. This study has provided evidence on the relationship of ownership structure and stock price crash risk by taking two measures of ownership structure; managerial ownership and institutional ownership. The study results suggest reducing the percentage of institutional ownership in the firm's ownership structure as it is positively associated with the stock price crash risk. The second hypothesis H2 accepted in this study by using the sample data and running panel regression on it, the positive relationship of institutional ownership and stock price crash risk proved. However, the managerial ownership is not significantly related to stock price crash risk in this study. Future research can be considered this topic by using various sectors, to find the impact of ownership structure on specific industries. Other variables of ownership structure can also use for further research on this area.

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Table 3: Variables Description Sheet

CATEGORY	VARIABLE	SYMBOL	DESCRIPTION
Independent Variable	Managerial Ownership	manown	The percentage of managerial ownership in the ownership structure of the firm.
Independent Variable	Institutional Ownership	conown	The percentage of institutional ownership in the ownership structure of the firm.
Control Variable	Firm Age	firmage	Firm age taken as the total number of years since the issuance of first IPO of the firm
Control Variable	Firm Size	size	Company's size, which is represented by the logarithmic of company's total assets
Control Variable	Leverage	lev	Company's leverage, which is calculated by the ratio of all the debt book value and total assets
Dependent Variable	Negative Skewness	NCSKEW	Negative skewness of firm-specific abnormal weekly returns over the fiscal year